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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

Editorial Staff

Geo. S. Demuth and E. R. Root
Editors

A. I. Root
Editor Home Dept.

Iona Fowls
Assistant Editor

H. G. Rowe
Mn'g Editor

Honey Wanted Honey

We are in the market for both comb and extracted. Send sample of extracted, state how put up, with lowest price, delivered Cincinnati. Comb honey, state grade and how packed, with lowest price, delivered Cincinnati. We are always in the market for white honey, if price is right.

C. H. W. Weber & Co.

2163-65-67 Central Av.,

Cincinnati, Ohio

HONEY CANS

Several carloads just received at our Ogden and Idaho Falls warehouses. We also manufacture shipping cases and beehives. Special prices on request. "Everything in Bee Supplies." Prompt shipments.

SUPERIOR HONEY CO., OGDEN, UTAH

(Manufacturers of Weed Process Foundation.)

WANTED---COMB HONEY

We are in the market for 10 to 20 carloads. Must be $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{7}{8}$ in beeway sections. Describe the quality, grade, and quantity, and when you will have it ready for shipment. Will take less than carload lots, if fancy and well packed in carrier. Also Extracted Honey—send sample.

HOFFMAN & HAUCK, INC., WOODHAVEN, N. Y.



HONEY

We are in the market for Comb and Extracted Honey. Send us a sample and tell us how much you want for it delivered to Cincinnati. We remit the day the shipment is received. No waiting for your money when you ship to MUTH.

BEESWAX RENDERING

From the looks of our Wax Rendering Department some of your wives read our advertisements. As soon as they read about saving the muss around the house and her wash-boiler she must have said, "John, you send that old comb to MUTH. No more mussing around this place."

Send for shipping tags or mark your name and ours plainly on the barrels. We will render the old comb and pay you the market price for wax, less 5c per pound for rendering.

Shake with H. N. MAJOR, South Wales, N. Y. Mr. Major is one of the leading Queen Breeders for his age. Keep your eye on him, he will be a second Doolittle. The other week Major wrote us like this: "I have worn all kinds of veils from homespun to factory-made—but for real work and comfort give me a 'MUTH IDEAL.'" Order one today, \$1.50.

FRICTION TOP CANS

	Per 100.	Per 10.
2½-lb. cans	\$ 4.25	\$.50
5-lb. cans	8.00	1.00
10-lb. cans	12.00	1.40

60-LB. SQUARE CANS

Used cans, good and clean, packed two in each crate. 1 to 9 crates, 70c per crate; 10 to 99 crates, 65c per crate; 100 crates or more, 60c per crate.

1-LB. SCREW TOP

HONEY JARS

2 dozen to case. 10-case lots, \$1.75 per case; 100-case lots, \$1.70 per case.

ITALIAN QUEEN BEES

PURE STRAIN.

Untested: 1, \$1.50; 6, \$8.50; 12, \$15.00.
Tested Pure: 1, \$2; 6, \$10.50; 12, \$18.

SPECIAL

SPECIAL

HONEY EXTRACTORS

No. 5 Novice 2-frame (a good little extractor)\$25.00

No. 15 Cowan 2-frame (A wonder for speed)\$32.75

THE FRED W. MUTH COMPANY

Pearl and Walnut Streets
CINCINNATI, OHIO

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION FIRST HALF OF JULY

CALIFORNIA POINTS.—Supplies of old crop cleaning up. New crop supplies are heavier. Movement is light. Little wire inquiry being received, and market is weaker. Carloads f. o. b. usual terms at leading points, per lb., white orange, new crop, wide range in prices, 8½-10c, mostly 9c; light amber alfalfa, old crop 5-6c, water white alfalfa new crop 7½-8c, white mesquite 6½c, white sage old crop 8½-9c, new crop 9-10c; light amber sage old crop mostly 7½c, new crop 7½c. Hawaiian f. o. b. San Francisco, white Hawaiian 6c, light amber 4½c, honeydew honey, dealers asking 4c. Producers are not inclined to sell at present prices. Current prospects are that the alfalfa crop will be below normal. Orange and sage will both have very short crop, sage ranging around 35% of last year's yield. Beeswax producers are selling more than during the last of June on account of extracting having been completed. Market is weaker but movement better. Dealers paying mostly 25c per lb. for crude wax.

INTERMOUNTAIN (IDAHO AND UTAH).—White sweet clover is quoted in carload lots at 7c per lb., f. o. b. loading station. In smaller quantities, white alfalfa-clover honey is moving at 12c per lb. White sweet clover in Arizona is said to be offered at 7c per lb. For average grade beeswax 26-30c is being paid.

MIDDLE-WESTERN STATES.—Thruout the Plains States white clover was partly winter-killed and dry, hot weather has since rendered the prospects still more unfavorable for a good flow of honey. Bees are said to be in good condition and healthy, altho few new swarms have come off.

CENTRAL STATES.—As usual, there is little movement of honey at this season of the year. There is said to be the best flow from sweet clover experienced in years. White clover is also producing well, altho curtailed by drought. The average yield is reported as around 50 lbs. per colony, with best colonies reaching 100 lbs. American foul brood is abundant in some localities, but otherwise the condition of the bees is normal. Local demand is good in some places, but carlots are moving slowly. White clover has been bought in large lots at 8c per lb., f. o. b., with small lot sales ranging around 15c for extracted and \$6.00 per 24-section cases for No. 1 comb. Beeswax is being bought for 26c per lb. in cash or 29c in trade.

NORTHEASTERN SECTION.—Due to abnormal weather conditions bees have not yet gathered much surplus. Recent heavy rains, however, may improve the fall flow of nectar. Fair prospects are expected for the buckwheat flow. A few small-lot sales of light amber are being made at 15c. Yellow beeswax is bringing around 27c per lb.

SOUTHEASTERN SECTION.—The honey crop in North Carolina is reported to be a complete failure; and thruout the rest of the South the flow is very light, due partly to dry, hot weather. The market is slow, and little honey is changing hands. A few sales of white honey are reported at 10-12c per lb. in small lots.

PACKAGE HONEY F. O. B. CALIFORNIA POINTS.—Fancy new crop white orange honey in small containers is being quoted f. o. b. California shipping points as follows: 2-lb. tins, 48 to the case, \$10.00 per case; 5-lb. tins, 12 to the case, or 10-lb. tins, 6 to the case, \$11.00 per case.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—1 car Porto Rico via New York City arrived since last report. Stocks on hand only moderate. Slightly better inquiry for extra-good extracted honey reported. Comb honey is slightly weaker with little interest shown. Comb: Sales to retailers, New York, 24-section cases white clover heavy, \$8.00-8.50; few best guaranteed free from candying \$9.00, light low as \$6.50. Vermont, 20-section cartons white clover \$7.00-7.75. Extracted: Sales to confectioners and bottlers, Porto Rico, amber 70-80c per gal.; California, white sage, few sales 16c per lb.

CHICAGO.—No straight carlot arrivals. Practically no f. o. b. buying, receipts being exclusively consignments and supplies reported as liberal. Mar-

ket very dull. Practically no demand. Trading practically at standstill on all grades. What few sales are being made are in small lots. Dealers willing to sell at even lower figures in order to move stock on hand. Extracted: Sales to bottlers, Michigan and Colorado, per lb., clover and basswood white 9-9½c, light amber 7½-8½c. Comb: Sales direct to retailers, Michigan and Ohio, No. 1, 24-section cases \$6.25; No. 2, poor condition, light, leaky or discolored sections \$3.00-4.00. Beeswax: Receipts moderate. Market about steady. Trading fair. Sales to harnessmakers and wholesale druggists, Missouri, Colorado, and Oklahoma, per lb., best, light 31-33c, dark 26-27c.

CINCINNATI.—Since July 1, 1 car Utah, 3,500 lbs. Ky. and approximately 2,000 lbs. from Ohio arrived. On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

DENVER.—Market inactive. Trading light. Extracted: Sales to jobbers, per lb. Colorado, white 11-13½c, light amber 10½-12½c, amber 10c. Comb: Colorado, 24-section cases No. 1, white old stock \$5.40 per case, new stock \$6.30.

MINNEAPOLIS.—No carlot arrivals. Extracted: Supplies light. Practically no demand. No sales reported.

KANSAS CITY.—No carlot arrivals since last report. Supplies light. Demand and movement light, market dull. Extracted: Sales to jobbers, Utah, extra-light amber, 11c per lb. Comb: Colorado, 24-section cases No. 1, white, \$6.00-6.50.

NEW YORK.—Domestic l. c. l. receipts very light, South American and West Indian receipts light. Supplies light. Demand and movement slow, market dull, few sales. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic, per lb. California, white orange blossom and white sage mostly 11-12c; light amber sage 9-10c, few 11c; white sweet clover 9-11c, light amber alfalfa 7-8c. South American and West Indian, refined per gal. best 55-60c, poorer low as 50c. Beeswax: Foreign receipts light. Supplies limited. Demand and movement light, market dull. Spot sales to wholesalers, manufacturers, bakers, and drug trade, per lb. South American and West Indian, crude light best 25-27c, few 28c, poorer low as 23c, dark 14-16c, African, dark, mostly 14-15c.

PHILADELPHIA.—Receipts very light. Supplies, altho light, are sufficient to supply demand. Movement to bakers continues light but there seems to be a little better demand. Extracted: Sales to bakers, Porto Rico and San Domingo, in barrels, dark amber 65c, light amber 68c per gal.; in 60-lb. tins dark amber 8c, fancy light amber 9c per lb. Beeswax: Supplies are generally moderate, but with practically no demand. No sales reported.

ST. LOUIS.—Comb: No receipts reported. Supplies light. No demand or movement. No sales reported. Extracted: Very light receipts of southern honey in 5-gal. cans reported. Supplies, including old stock, liberal. Demand draggy and movement limited, market weak and prices only nominal. Few sales direct to retailers in small quantities in 5-gal. cans. Southern, various mixed flavors per lb. best light amber 9-10c, dark and inferior 6½-8c, mostly 7½-8c. Others, no sales reported. Beeswax: Receipts very light. Supplies light. Limited demand in small quantities but very little moving. Market is very quiet altho prices remain firm. Sales to jobbers, southern, ungraded average country run 25-26c per lb.

H. C. TAYLOR,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—The market has been very much easier since our last report. There is a fair export demand for Chilean. The value of extracted honey at today's rate of exchange is 5 cents per lb. The value of beeswax in American currency is about 22 cents per lb.

Taylor & Co.

Liverpool, England, July 6.

CUBA.—We quote extracted honey at 35 cents a gallon, and yellow wax at 20 cents a pound.

Matanzas, Cuba, July 12. Adolfo Marzol.

Opinions From Producers.

Early in July we sent to actual honey producers, scattered over the country, the following questions:

1. What has been the average yield per colony to date for your locality? Give answer in pounds. Comb honey? Extracted honey?
2. How does the total crop compare with normal in your locality? Give answer in per cent.
3. What price are producers asking for the new crop in large lots? Comb honey? Extracted honey?

It will be noted that the prices given by some of the reporters are for large lots, while others quote prices in small lots to the retail grocer.

State.	Reported by	Yield		Price	
		Comb.	Ext. Crop.	Comb.	Ext.
Ala.	J. M. Cutts...	25	17	50	\$2.0
Ark.	J. Johnson...	12½	0	100	.30
Ark.	J. V. Ormond...		20	50	.25
Cal.	L. L. Andrews...	1	10	12	.10
Cal.	C. W. Hartman...		27	12	.09
Colo.	J. A. Green...	5	20	85	
Colo.	B. W. Hopper...		5	5	5.50
Conn.	A. Latham...	30	50	150	
Conn.	A. W. Yates...	10	10	50	.35
Fla.	H. Hewitt...		35	100	.12
Fla.	W. Lamkin...	40	80	100	.10
Ga.	J. J. Wilder...	30	50	70	5.00
Ida.	J. E. Miller...				.15
Ill.	C. F. Bender...	10		25	.30
Ill.	A. L. Kildow...	10	15	15	
Ill.	A. C. Baxter...	25	60	40	.25
Ind.	E. S. Miller...	35	50	90	6.50
Ind.	Jay Smith...	35	60	100	.35
Ind.	T. C. Johnson...	40	50	100	
Ia.	E. G. Brown...		50	50	.12
Ia.	W. S. Pangburn...			5	.16
Kan.	C. D. Mize...	40	50	60	
Kan.	J. A. Nininger...	10	30	80	7.00
Ky.	P. C. Ward...		32	70	.15
Me.	O. B. Griffin...	20		40	.30
Md.	S. J. Crocker...	15	20	25	.25
Mich.	L. S. Griggs...		75	75	.18
Mich.	I. D. Bartlett...		25	35	.36
Mich.	B. F. Kindig...	60	90	100	.25
Mich.	F. Markham...	75	100	100	.25
Mich.	E. D. Towns'd...		50	65	.15
Miss.	R. B. Willson...	20	45	100	.32
Mo.	J. H. Fisbeck...			60	
Neb.	F. J. Harris...		10	10	
Nev.	T. V. Damon...			50	
Nev.	L. D. A. Prince...				5.50
N. H.	J. R. Hepler...	25	65		.40
N. J.	E. G. Carr...		40		.32
N. Y.	O. J. Spohn...	40	60	60	.25
N. Y.	Geo. Howe...		20	25	.17
N. Y.	G. H. Rea...	20	30	50	
N. Y.	F. W. Lesser...	30	50	66	
N. Y.	N. L. Stevens...		50	150	.12
N. C.	W. J. Martin...				.15
Ohio.	E. G. Baldwin...	30	60	100	.25
Ohio.	F. Leininger...	70	100	70	.20
Ohio.	R. D. Hyatt...	70	130	125	.15
Okla.	C. F. Stiles...	20		50	
Ore.	E. J. Ladd...	50	75	100	6.50
Ore.	H. A. Scullen...		50		.15
Pa.	D. C. Gilham...	16	25	40	
Pa.	H. Beaver...	30	40		5.00
R. I.	A. C. Miller...		20	100	.30
S. D.	L. A. Syverud...	50	75	100	5.00
Tenn.	G. M. Bentley...	60	70	100	.11
Tenn.	J. M. Buchanan...	40	60	100	.30
Tex.	J. N. Mayes...		70	75	.13
Tex.	H. B. Parks...		50	100	.09
Tex.	T. A. Bowden...			75	
Utah.	M. A. Gill...			110	5.00
Utah.	N. E. Miller...			100	.10
Vt.	J. E. Crane...	10		25	
Va.	L. N. Gravely...	5	8		.25
Va.	T. C. Asher...	10	15	20	.15
Wash.	G. W. B. Saxton...			166	.12
Wash.	W. L. Cox...	5	0	100	.13
W. Va.	T. K. Massey...	0	0	0	
W. Va.	W. C. Griffith...		100	300	.25
Wis.	E. Hassinger...		50	60	.12
Wis.	H. F. Wilson...		37	62	.18
Wis.	N. E. France...		40	85	.15
Wis.	Gus Dimer...	0	0		

QUALITY QUEENS

During August, September, and October we will have a surplus of guaranteed stock of Untested Queens at \$1.00 each. Special prices on lots of fifty or over.

THE A. I. ROOT CO. OF TEXAS
Box 765, San Antonio, Texas.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

MOTT'S NORTHERN-BRED ITALIAN QUEENS.

For July: Sel. Untested, \$1.25 each; \$15.00 per doz. Sel. guaranteed pure-mated or replace, \$1.75 each; \$18.00 per doz. Sel. Tested, \$2.50. Filling orders by return mail now with the aid of my Southern branch. Plans "How to Increase" and "Introduce Queens," 25c.

E E. MOTT, Glenwood, Mich.

COPPER CANS



of Heavy Cold Rolled Copper with Screw Caps, Highest Grade Cans on the Market. Mail orders Shipped at once in Strong Wood Boxes. Money Back if Dissatisfied. Circular Free. Hydrometers \$1.50.

STANDARD METAL WORKS

6 Beach St., Boston, Mass. Depl. 047.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.

306 E. 5th St., Canton, O.

Five-Pound and Ten-Pound Friction-Top Pails

We are naming prices below on these pails, and please note that **THESE PRICES ARE F. O. B. CARS LANSING**, and not from some distant factory point from which you will get slow delivery and high freight rates:

	25	50	100	200	500
5-lb. Friction-top pails	\$2.25	\$4.25	\$ 8.00	\$15.75	\$38.00
10-lb. Friction-top pails	3.00	5.90	11.50	22.50	55.00

5-lb. Pails per wooden case of 12, per case \$1.40; 10 cases \$13.
10-lb. Pails per wooden case of 6, per case \$1.10; 10 cases \$10.

Comb Honey Shipping Cases

There is an increasing interest in the production of comb honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote on application.

We can make immediate delivery on seasonable items, such as sections, comb foundation, extractors, etc.

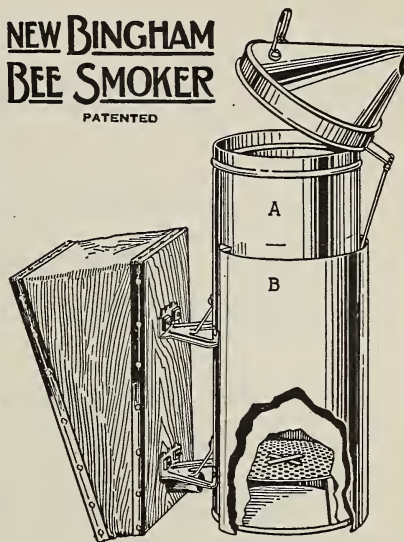
M. H. HUNT & SON

510 North Cedar Street, Lansing, Michigan

Buy Bingham Bee Smokers

**NEW BINGHAM
BEE SMOKER**
PATENTED

On the market over 40 years. The bellows of best quality sheepskin is provided with a valve, which gives it pep and makes it respond quickly to the most delicate touch, giving as much or as little smoke as is required. The Big Smoke size, stove 4 x 10 inches, with asbestos-lined shield, permits the holding of the smoker between the knees without danger of burning the trousers or one's legs. This size is much appreciated by extensive operators.

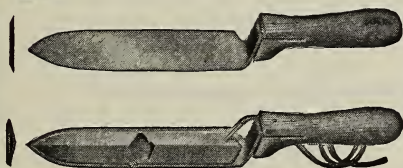


Postage extra.	Size of stove, ins.	Shipping wt., lbs.
Big Smoke, with shield.....	4 x10	3
Big Smoke, no shield.....	4 x10	3
Smoke Engine	4 x7	2 1/4
Doctor	3 1/2 x7	2
Conqueror	3 x7	1 3/4
Little Wonder	3 x5 1/2	1 1/2



Buy Bingham Honey Uncapping Knives

Made of the finest quality steel for the purpose that money can buy. These knives of the proper thickness and quality have given the best of satisfaction, as the old timers will testify. For over thirty years the men engaged in the manufacture of these knives have been at this work. The perfect grip cold handle is one of the improvements.

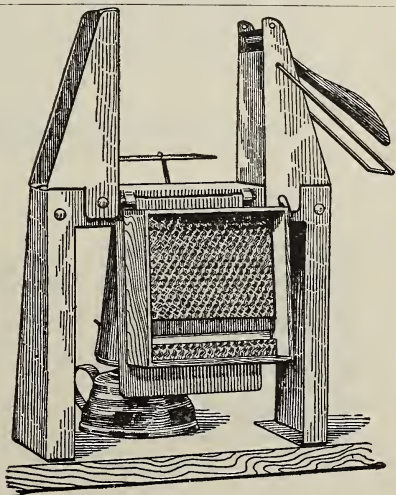


Buy Woodman Section Fixer

One of our men, with the Section Fixer, puts up 500 sections with top starters in one hour and thirty minutes, 500 sections set up with top starters in ninety minutes. This includes the labor of cutting foundation, getting sections and supers and placing the sections into the supers and carrying them away. A complete job. This is nothing unusual, but his regular speed. You can do the same if you have the push, after you become accustomed to the work. There is no breakage of sections. It will pay you to secure one of these machines for this work. It is the best thing of the kind on the market.

SPECIAL SALE HONEY PACKAGES.

Get our latest reduced prices on all honey packages. Let us add you to our large list of pleased customers on this line of merchandise. Special prices on shipments from factories direct to customer. Sixty-pound cans in bulk and in cases, Friction-top Pails and cans all sizes. Clear flint glass, Mason jars pints and quarts, tumblers, pound jars and other sizes. Get on to our list, so as to get quotations.



A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

A Postcard to You

Did you get our postcard announcing lower prices? It was mailed to you early in the month of June.

32 per cent reduction on famous No. 1 Lewis section boxes.

30 per cent reduction on all hives, bodies, supers, and covers.

Many other low prices on items you may need now. These apply to No. 1 grade of goods only.

Also ask for bargain list on "Odd Lot" goods.

Italian Queen Bees

August is the season for requeening in most parts of the U. S. A., just at the end of the honey flows. Arrangements have been made with one of the best Southern queen-bee breeders to furnish 3-banded Italians to enable beekeepers to introduce better stock. Prompt shipment, safe arrival, and satisfaction guaranteed in U. S. A.

Price, \$1.00 each, untested.

Price, \$2.25 each, tested.

LOOK FOR THIS



G. B. LEWIS COMPANY

Home Office & Works, Watertown, Wis., U.S.A.

Branches: Memphis, Tenn.; Albany, N. Y.; Lawyers, Va.

Distributors Throughout the U. S. A.

Ask for a "Beware" Catalog today.

REGISTERED MARK

GLEANINGS IN BEE CULTURE

AUGUST, 1921

OUR FRONT cover this month shows one of the apiaries of The A. I. Root Company near Medina, Ohio, as it appeared in July before any of the honey was taken off. The Root Company has near Medina a series of apiaries which are operated for extracted honey. The crop from these apiaries this season will probably be somewhere between one and a half and two carloads of honey.



Our Cover Picture.

A PECULIAR honeydew is sometimes gathered from scrub pine in considerable quantities, which contains the rare trisaccharide, melezitose. Minute quantities of this rare sugar have been available to scientists for many years, but never in larger quantities until it was discovered in honeydew in this country. It derives its name from melez, the French name for larch tree, on which it was originally discovered as honeydew. It also occurs as manna on a leguminous tree in Persia. Recently it has been found in the form of honeydew on the Douglass fir in British Columbia and from scrub pines in Pennsylvania and Maryland.

Honeydew which contains melezitose granulates almost as fast as it is stored in the combs, and sometimes the dry crystals can be seen in the bottom of the cells even when only a few drops of nectar have been deposited in them. Some manufacturing chemists desire to obtain honeydew which contains melezitose, and beekeepers who are located where it is gathered freely may be able to supply this demand, which is, of course, for limited amounts only. Just now we have a letter from the Digestive Ferments Co., Detroit, Mich., inquiring where such honeydew can be obtained. Beekeepers who have a supply of honeydew which granulates quickly could determine whether it contains melezitose by sending a sample to this firm.

OUR READERS will find a vast amount of information within a small space in the Opinions of Producers on our market pages. Southern



What Has the Harvest Been?

California has had a very poor yield from orange and sage, while farther north in the State the yield is better. Taken as a whole the reports

from California indicate that the crop in that State will be far below normal. It is too early to estimate the yield from alfalfa and sweet clover in the Intermountain region; but present indications are that the crop will be below normal in Colorado, Idaho, and Nevada, while farther north prospects apparently are better. Reports from the sweet clover belt of the Missouri River Valley indicate a good yield from this source. Reports from Texas are much more encouraging than earlier in the season, and some parts of this State at least will have a normal crop. In the white clover region the area of heaviest yield apparently is northern Ohio, eastern Indiana, southeastern Michigan, and Ontario, where the yield is well above 100 pounds per colony in well-managed apiaries. Outside of this area the yield from clover is spotted. Northern New York and Vermont report but little surplus. Central and western New York report yields from 20 to 50 pounds per colony. In Wisconsin, Illinois, and Iowa the yield is spotted, but generally somewhat below normal, except that western Iowa has a good crop in the sweet clover section. The Atlantic Coast States south of Pennsylvania have secured but little surplus honey except in some portions of Florida. Eastern Tennessee reports a good crop from clover.

ALTHO it was the plan of the committee in charge of the contributions for the Doctor



Contributions to Doctor Miller Memorial to Continue.

Miller Memorial Fund to close the subscriptions in June, it

has been decided to continue the effort until a larger amount has been collected. Some scattered contributions are still being received, and members of various beekeepers' associations have suggested that their associations may desire to contribute. "The Bee World" of England and the "South African Bee Journal" are asking their readers to contribute to this fund, and it will take some time for these contributions to be collected and sent to this country. Surely, if men in other parts of the world are eager to honor the memory of Doctor Miller, a greater number of the beekeepers of the United States than have already contributed will desire to do so if given more time. The committee has decided to continue its efforts to collect a fund large enough to provide a lasting me-

morial that shall be a fitting tribute to this great man, even if it takes many months to do it.

The following letter from Doctor Phillips expresses clearly the viewpoint of the committee in making this decision:

Dear Mr. Root:

I have your inquiry regarding the desirability of continuing the effort to obtain subscriptions for the Miller Memorial Fund. I am very much in favor of going right on with this until all beekeepers who wish to do so may have the opportunity to contribute. The amount so far obtained does not, I am sure, include contributions from all who have been benefited by the life and work of Doctor Miller, and it would be a pity to close this fund until all have had a chance to do their part. The various associations will doubtless take this up at their meetings, and more money will come in.

When we consider what the work of Doctor Miller has meant to the beekeepers of the whole world, it is evident that there are many more who will feel it a duty and privilege to help. Those beekeepers who had had but who conquered European foul brood will realize that but for the work of Doctor Miller their returns from their bees would be many thousands of dollars less, and they will want to show their appreciation of his aid. Comb-honey producers who successfully control swarming in out-apiaries realize that without his aid they would necessarily be content with less colonies of bees, and they will wish to share the extra profits in honoring the man who, more than any one else, made their larger operations possible. Many other classes of beekeepers could be mentioned who have received financial benefit from his work; but there is the still larger class of beekeepers who are better, bigger men and women because of his life, and that is an obligation which we can not pay off in dollars. This calls for our best efforts.

Under these circumstances, it seems to me that we should go on asking for funds, until we get an amount that will be a living, growing thing, which will for all time benefit beekeepers everywhere, for that was what Doctor Miller wanted to do more than anything else on earth. There is no hurry about closing this up, for the memory of Doctor Miller is not a transient thing, and beekeeping will last as long as there are flowers and bees, without which none of us would care to stay here. Let's keep at this until the fund can do for beekeeping what Doctor Miller would so much have liked to do.

Very truly yours,
Washington, D. C., June 28. E. F. Phillips.

Subscriptions may be sent to any member of the committee, as follows: C. P. Dant, Hamilton, Ill.; B. F. Kindig, East Lansing, Mich.; E. G. LeSturgeon, San Antonio, Texas; Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.; E. R. Root, Medina, Ohio.



WHILE beekeepers are harvesting their crop of honey they are usually too busy to give much thought to



Preparations a subject so remote
For Winter. as the preparation for

next year's crop, yet the beginning of the foundation for the 1922 honey crop is made this month, whether the beekeeper directs it or not. With all that has been written on the subject of wintering, too little emphasis has been placed upon the history of the colony during late summer and fall, and much of the so-called winter loss should not be charged to the winter but rather to late summer and fall management. Really, the problem of

wintering begins about the middle of August, for the condition of the colonies from that time until brood-rearing ceases determines largely how well they will winter.

Where brood-rearing ceases early in October, as it does thruout the greater portion of the North, the bees which form the winter cluster must be reared in August and September. When conditions are favorable the bees will rear plenty of young for winter without any attention on the part of the beekeeper; but if conditions are not favorable for a moderate amount of brood-rearing during any considerable part of the time after the middle of August, the bees may be in poor shape for winter.

Colonies that are queenless or that have old or failing queens during this period can not be expected to withstand the winter. While it may not be profitable for extensive honey producers to examine every colony to find a few that may be queenless, beekeepers are finding that systematic requeening in July and August pays well for the time it requires. In the North many beekeepers advocate replacing the queens after the second year, usually requeening half of the colonies each year. Farther south, where the seasons are longer, many find it profitable to requeen every year.

Midsummer requeening is especially profitable in those localities where there is a dearth of nectar during August and September, for a young queen that begins to lay this month will usually lay enough eggs, even during a dearth of nectar, to make a fair-sized winter colony if there is enough honey in the hive to feed the brood, while an old queen would practically cease egg-laying. In addition to this the young queen reared at this time is in prime condition for her heavy work next spring.

Colonies that run short of stores after the middle of August may be ruined by living on the verge of starvation for even a few weeks at the time the winter bees should be reared. Thousands of colonies have been lost during the winter and the loss counted as winter loss, because the beekeeper extracted all the honey from the supers, expecting the bees to get along with what was left in the brood-chamber. When this is done the bees are almost sure to run short of honey just when they should be rearing young bees to tide the colony thru the winter, unless there is a fall honey flow sufficient for their needs.

Some of our best beekeepers are now solving this problem by leaving from five to seven full-depth combs of honey in the last super when extracting, or providing each colony with a shallow extracting super filled with honey. Of course, where there is a fall honey flow, this is not necessary; but, unless the fall flow is assured, the leaving of plenty of honey now is a good form of insurance.

Now that the problem of marketing honey is a serious one, the beekeeper may well

become one of his own customers and use a portion of the honey, which he could have extracted, to help insure the prosperity of his colonies for next year.



UNDER the present conditions of the honey market it behooves every beekeeper to sell



Selling Honey Locally.

every pound of honey locally that is possible. Every pound that can be sold in this way relieves the wholesale market just that much, and in most cases that which is sold locally goes to consumers who could not be reached thru the ordinary channels of trade, thus to a large extent opening up a new outlet for honey.

During the past few years, when the demand for honey was heavy, much honey was diverted from the local market to the wholesale market. It was so much easier to ship the entire crop to a dealer at a good price (in many cases more than could be obtained locally) than to sell it in small lots near home that producers could not afford to supply the local trade. This has all been changed within a year, and many beekeepers are now selling their honey to farmers and others in their locality, some extensive producers being able in this way to dispose of their entire crop. For this class of trade the five and ten pound pails are being used more and more.

Those who are located on much traveled automobile routes can sell large quantities of honey at the roadside to passing motorists by putting up an attractive sign where the driver cannot fail to see it. Many beekeepers sell thousands of pounds in this way every season. Many of those who buy honey in this way do not know that pure honey can be purchased in the city. In fact, most of them probably have never given the subject of honey a thought before seeing the honey sign at the roadside. The idea of new honey fresh from the country appeals to many city folks when it is brought to their attention in this way, and a new customer as well as a new booster for honey is thus made, provided the beekeeper is wise enough to offer for sale only the very best quality of well-ripened honey.

While it is not necessary that the apiary be in sight, to sell honey at the roadside, it is well to have at least a few colonies of bees to help attract the attention of the motorist. People like to buy honey from someone who has bees, and if the honey sign at the roadside can be so located that the approaching motorist is led to glance from the sign to the beehives, the combination should have the desired effect if the driver is at all fond of honey.

Another aid to the selling of honey locally is advertising in the local paper. This may be only a line or two, or it can be made a half-page honey advertisement, as the honey producer chooses. The small adver-

tisement will help much, and the large advertisement will help more. Whatever the size of the advertisement, emphasize the food value and deliciousness of honey and the fact that it is a safer and better sweet than any other. Also tell just how it can be ordered and delivered.

The beekeeper who is not a salesman may find a neighboring beekeeper who is a good salesman and who can dispose of more honey than he produces. By turning over his crop for the other man to sell, Mr. Poor Salesman will be helping himself as well as the man who sells it for him.

In every case where honey is sold locally, the beekeeper should demand a price sufficient to pay him well for the trouble of selling. He should remember that in selling his product direct to the consumer he is rendering a service which is worth money and he should secure pay for it.

It often happens that a beekeeper sells all the honey to a local dealer that he can induce him to take, then afterwards peddles out the remainder of his crop to this dealer's customers at the same price he received from the dealer. Such a procedure is not only unfair, but it is poor business. When all the costs of selling are counted, as they should be, the beekeeper will no doubt find that it costs him more to sell honey than it does the dealer. If this cost is not added to the price of the honey, the producer loses this amount which is rightfully his. If this represented all the loss it would not be so bad, but the producer who does this, by shutting off the trade of his local dealer, is closing one of the channels thru which he expects to market a part of his honey in the future.

Just what price the beekeeper should ask for his honey when selling locally at retail will depend upon circumstances, but in any case it should not be materially less than the local dealer is asking. Gleanings is gathering all of the data obtainable as to crop and market conditions thruout the country. This information is published on our market pages, and every beekeeper who has honey to sell should study these pages carefully. Generally speaking, the retail price is more than double that of the price in 60-pound cans when the crop is sold in one lot. At first this may seem like too much difference, but when the cost of the packages, the expenses connected with selling, and the time of the salesman are counted the costs mount rapidly.

To a few beekeepers, selling honey locally at retail is a disagreeable task which they will avoid if possible, but under present conditions something must be done to induce people to eat more honey, if the beekeeping industry is to thrive. If thousands of beekeepers will take part in a drive of this kind now, beekeeping should be able to tide over these trying times and be in better condition to supply the demand for honey when normal times return.

I CAME after a 10-pound pail of honey," she said. "Sorry, but we haven't a pail left," was the reply. "You don't mean to say you have sold all that honey you had here at the beginning of the Fair," she said. "Yes, the last pail went Friday night."

She couldn't believe it. She was in the first day or two of the Fair and saw 10,000 pounds of honey piled up in glass and tin. She was sure there was enough in that pile to supply all Detroit. She thought she had plenty of time to buy all the honey she wanted before the Fair was over. She was not alone in her disappointment. Many were the requests for honey the last few days of the 1921 Michigan State Fair that had to be refused. And this opens up an interesting story of fair exhibits.

A New Judge.

In the spring of 1907, a carload of bees and hives arrived at Caro, Mich.; that is, the car contained nothing but the 50 hives of bees and their equipment. As that kind of freight was not arriving regularly, it was the occasion of a write-up in the local press. The bees and equipment belonged to the writer.

The year previous there was dissatisfaction on the part of the largest exhibitor at the Michigan State Fair in regard to the judging. The superintendent of the bee and honey department knew nothing about

STATE FAIR EXHIBITS

The Dawning of a New Era in Honey Exhibits. The Michigan Plan

By E. B. Tyrell

[Instead of a number of small competitive exhibits of honey scattered here and there among exhibits of other products, let us suppose a state beekeepers' association putting up one large exhibit on the co-operative plan, the honey being uniform in quality (all the very best), and packed in uniform packages, each bearing the association label. Suppose further that the honey is sold on the grounds, the beekeepers who own it being sent a check at the close of the fair instead of having the honey returned to them, thus insuring a liberal supply for an exhibit which does justice to the industry. Suppose, again, that experts in the art of arranging attractive displays have charge of the honey exhibit and that these experts are furnished an entire building in which to display the honey, the exhibit being arranged in such a manner that visitors as they enter the building are overwhelmed with the magnitude of the display, which is a single large unit instead of many small units, leaving the impression of acres of honey. What would be the advertising value of such an exhibit? In this article Mr. Tyrell tells us what Michigan is doing along these lines. Ohio has already adopted the Michigan plan, and no doubt, other States will try a similar plan this year.—Editor.]

bees. He also lived in Caro. When he read that newspaper item he interviewed the writer, with the result that the bee and honey exhibit, the next year at the State Fair, had a new judge.

For five years I continued judging. I used the comparison method—a method, I afterwards learned, which seems to be a standard method used by the best judges in England. I did not try to determine points. So far as I know, my judging satisfied the exhibitors. Then

I was appointed assistant superintendent of the bee and honey department, and served as such for four years, or until 1916, and since that time I have been superintendent.

System Was Wrong.

But there was something wrong with our system. We couldn't get the exhibitors. We wrote letters. We pleaded at conventions. At the suggestion of the beekeepers, we increased the premiums. It was no use. Only two or three exhibitors would show up, and one year only one. The beekeepers said it cost too much to take honey to the Fair, and it didn't pay; or they had too much work to do at that time. It got to the point where the fair management threatened to throw the whole bee department out.

It was at that time that I proposed a mutual exhibit. I recommended cutting out the premium list entirely and making an appropriation to equal the premiums offered—



Co-operative honey exhibit at the Michigan State Fair, 1919. The amount of honey was doubled in 1920.

this appropriation to be used to pay the expenses of getting up the exhibit. Secretary George W. Dickinson of the Fair told me to go to it, and if the beekeepers didn't respond we might as well discontinue the department. But the beekeepers did respond.



Supt. E. B. Tyrrell examining the first week's work of an Italian swarm which he caught in Detroit this year, and transferred to the Fair Grounds for next fall's exhibit. This swarm had already built some comb in the tree when taken.

They were a little timid at first, as it was an untried experiment. The plan was for the State Fair to select and purchase certain glass and tin packages and labels and buy them. These packages and labels would be sent to the beekeepers who would agree to put up the honey as directed and ship it to the fair. At the close of the fair, the honey was to be sold at wholesale, and the beekeepers would receive a good wholesale price for their honey, instead of having the honey sent back. The first year, each exhibitor's honey bore his number on the label. Then a printed list of all exhibitors, with their corresponding numbers, was furnished those visiting the exhibit. In that way, each purchaser of honey would be able, by referring to the list, to know who produced it. Hundreds of these lists were given away.

Trying to Push Michigan Honey.

But this plan was not the best because we could not always make an equal distribution of the exhibitors' honey. And it centered the buyer's attention on one exhibitor. What we were trying to do was to push Michigan honey, and not any one producer.

We wanted them to think that all honey on exhibition at the Fair was good, and that all exhibitors were worthy of equal confidence. So the second year, the list was printed without the numbers. No one could tell which exhibitor produced the honey he bought. And it was almost impossible for the ones in charge to tell either. The printed list was distributed again the second year, with no numbers. Several thousands of these were used. The same thing was done the third or last year.

Ten Thousand Pounds of Honey Exhibited.

In 1918, the first year the mutual exhibit was tried, there was about 2,500 pounds of honey on display. Much of it was sold during the fair at retail, but there was quite a lot left at the close to sell at wholesale. In 1919 the amount of honey was increased to 5,000 pounds, and only a very little was left at the close of the Fair to sell at wholesale. In fact, orders were received during the Fair for all there was left, to be delivered at the close of the Fair. The 1920 exhibit had 10,000 pounds of honey, and every pound was sold and taken away during the Fair, with many calls for more that could not be supplied.

The first year, the beekeepers sent in the honey and were paid what it brought at the close of the Fair. We tried to get many to send. The plan was expensive, as the express rates were high. Both packages to the beekeepers and honey to the Fair were sent by express. Some exhibitors did not pack properly and there was loss by break-



Secretary-Manager Michigan State Fair, G. W. Dickinson, getting acquainted with bees to be used in this year's exhibit.

age. The Fair stood all such losses, however. The second year was better, as packing instructions were followed, resulting in less breakage.

Last year the Fair bought the honey outright from the beekeeper, at a price previously agreed on. Quotations were asked for from all interested and the honey was bought at the price quoted. It could have been bought cheaper; but we wanted the exhibitor satisfied, and we wanted the best he had. No one was prevented from sending honey, however, for which he would be paid, and his name would be printed in the list that was given out during the Fair. As stated there were 10,000 pounds of honey on display, all arranged along one side of the building. An entire building has been used each year for the mutual display, while before we had only a part of the building. On the opposite side were four colonies of bees in glass hives, connected with the outdoors by two-inch gas pipes, the bees working thru these during the Fair. They put up a much better appearance when so connected, because they were natural and were not running around in the hives. These hives were all glass, there being no wood or metal corners to obstruct the view.

Handling Live Bees.

In addition to these four hives, was one other colony in a regular ten-frame hive, in a large screen enclosure. At a certain time each day this hive was opened, the frames covered with bees were taken out, and a brief lecture on the production of honey was given. No attempt was made to make this demonstration spectacular. In fact, the opposite was tried. It was only to show the everyday workings of the beekeeper. Two exhibitors of bee supplies were there showing a full line. Both, I believe, have arranged to be present again this year, with, in one case at least, doubled space. Their displays were certainly a gathering place for beekeepers and others.

The Michigan Agricultural College has been represented at each of the three mutual exhibits. Last year samples of honey from different sources, honey vinegar, samples of

foul brood, and many placards telling about bees and honey were shown. A representative was in charge during the Fair, and he was kept busy explaining and answering questions.

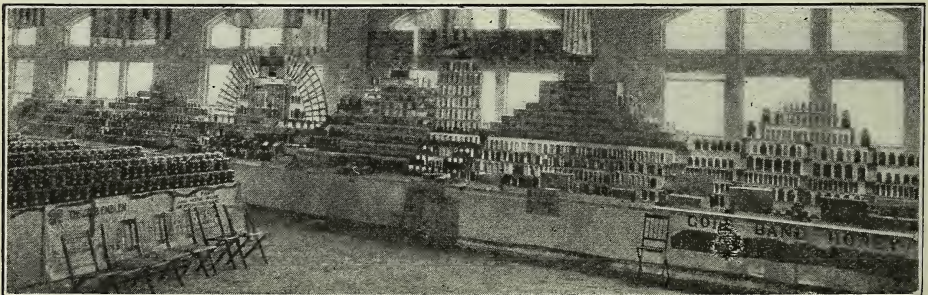
A Commercial and Educational Exhibit.

Summed up, the exhibit as now conducted is far ahead of the old competitive plan. There is no question now as to whether there will be an exhibit. Before we never knew until the Fair started what we would have. Then it was a mixture of each individual's ideas. Today it is uniform. Every pound glass jar looks like every other pound glass jar. The labels are all alike. Last year five packages were used: the 5-ounce jelly, the 8-ounce glass jar, the 1-pound glass jar, the 5-pound tin pail, and the 10-pound tin pail. Labels read, "Prize Honey, put up for the 1920 Michigan State Fair by members of the Michigan State Beekeepers' Association." There was no address. Of course, the weight was also put on.

This year, the same general plan will be used. The honey will be bought outright. The State Fair will furnish the packages and labels. They will be shipped to the beekeepers for filling. About the same quantity will be secured. The Fair will own its own bees, however, as it now has four colonies on the grounds working. The honey will be sold at retail, as hundreds of people are now depending on the State Fair for their supply of honey. It advertises Michigan honey, and gets people eating honey who would not otherwise do so. And remember that we are pushing the large package—the 5 and 10 lb. pail. We can put up any-sized display we want on the present plan, and, last but not least, we can plan the display in advance.

I am frank to say that these results could not have been accomplished without the splendid co-operation given the beekeepers by the secretary and manager of the Michigan State Fair, George W. Dickinson. You will have a hard time making a good bee department unless the manager of the fair is with you.

Detroit, Mich.



Honey display at the Wichita Wheat Show, Wichita, Kansas. Note the appearance of large quantities of honey.

PROTECTION OF NECTAR

Some of the Adaptations which Protect Nectar and Pollen from Moisture and Theft

By Prof. K. M. Wiegand

THE flower as an organ of the plant has to do with the production of seed, in which process, as is well known, cross-pollination is essential. In fact, many of the most important features of the flower, such as the showy corolla, scent, and nectar, are provided for the distinct purpose of making more certain this transfer of pollen from the anther of the plant where it is produced to the pistil of another plant in the ovary of which young seeds (ovules) are to be "fertilized." Plants, like thrifty human beings, practice a rigid economy in their living conditions. To produce more nectar and pollen than is actually necessary, or to allow these to be injured or stolen, would be inefficient and wasteful. To allow the nectar to be washed away by rain, or carried off by insect visitors that would not be effective in securing cross-pollination, would be poor business. We find plants adopting all sorts of means to obviate these dangers, and these contrivances are among the most interesting facts connected with the always interesting subject of floral biology.

Why Pollen Must Be Protected from Moisture.

The pollen of most plants is more or less injured by rain or dew. The pollen grains normally develop tubes in the fluid secreted on the stigma of the flower, and these tubes grow down thru the tissue of the style to the ovules below, but in pure water they swell up and for the most part eventually burst. For this reason the botanist who wishes to germinate the pollen in the laboratory artificially must plant his pollen not in pure water, but in a sugar solution approximating in strength the stigmatic fluid. Consequently we find various methods employed by the plant to protect the pollen from the wet. In most cases the same means employed to protect the pollen is equally efficient in protecting the nectar. These methods have been studied by the Austrian botanist Kerner, who has noted a number of ways in which this is accomplished.

Protection by Hanging Position.

Some plants have bell-shaped, urn-shaped, cup-shaped, or tubular flowers which are pendent on curved stalks. The rain falls on the outside of such a flower without wetting the stamens which are within. A few flowers of this type are the blueberries, bluebells, foxglove, lily of the valley, and basswood, but there are many others. Such flowers are always open for the visits of insects while at the same time they are always protected from sudden showers. A modification of this type is where the whole flower cluster is pendent as in the black cherry and

chokecherry. A more distinct modification of the same method is found in those cases where the flowers assume a pendent position only in wet weather or at

night when the dew is liable to be heavy. This change in position of the flowers is effected either by a curvature of the pedicel of the flower or by a general drop of the whole flower cluster or in some cases by a nodding curvature of the whole top of the plant. Anemones, herb robert, chickweed, potato, English daisy, sow thistle, coltsfoot, buttercups, certain bluebells, and a great many other plants show this movement in rainy weather or at nightfall.



The nectar is protected from rain in the basswood by the hanging position of the flowers.

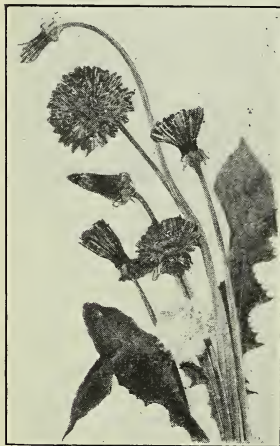
Another common and efficient method of protection lies in the ability of some flowers to close in rainy weather or at night. In the case of simple flowers it is the corolla or perianth which closes, as in the crocus, tulip, peony, rose, jimson weed, water-lily anemone, California poppy, and other species. The California poppy is especially interesting because, instead of the whole flower closing, each of the four petals forms a little tent over the pollen and nectar at its base, while the stamens, which have shed their pollen into the base of the flower remain exposed. In other so-called compound flowers, such as some members of the sunflower, of which the New England aster, dandelion, salsify, and devil's paint brush may be mentioned, the set of ray flowers close together so that the flower appears to be yet in bud.

Another rather common method by which the pollen is protected, altho not the nectar, lies in the so-called hygroscopic nature of the anther walls in many plants. On the approach of wet weather the anthers, which have opened to allow the escape of pollen, close up again. This condition can be seen

only on close inspection, and there are probably more cases of the sort than are now known. In such plants usually no other means of protecting the pollen is present, and this substance at first appears to be wholly unguarded. The pollen of plantains, meadow rue, grape, tulip tree, and many other plants is thus protected, and this is probably the most common method of protection in the wind-pollinated catkin-bearing trees.

Protection by Special Contrivances.

Another way by which both pollen and nectar are protected is found in flowers of the so-called salver-form type with narrow tube and spreading border. The opening to the tube is often smaller than the tube itself, and the surface of the corolla is not wetted by the drops of rain which roll over the surface of the corolla. Because of surface tension these drops can not enter the narrow orifice of the tube without pressure being brought to bear to distort the drop and force it thru the opening. The nectar and honey inside the tube are thus efficiently protected from the wet. Among flowers of this sort are the phlox, forget-me-not, primrose, and many pinks.



The dandelion protects its nectar at night and during rainy weather by closing its flowers.

Other more special contrivances may be noted as in the touch-me-not or jewelweed and other plants where the flowers are hung underneath the leaves which shed the raindrops unwetted; in the jack-in-the-pulpit and skunk cabbage in which the arching spathe incloses and roofs over the cluster of flowers; in the iris where the stigmas form

a roof over the anthers; and in the sunflower family where the pollen is inclosed at first in the anther tube. The ornamental plant *Cobaea* and some other plants possess difficultly wetted pollen grains with a honeycomb-like surface, the pits of which contain sufficient air to retard greatly the wetting of the grain. A more common method of protection is found in the plants with pea-like flowers such as peas, beans, clovers, alfalfa, and the like, and in snapdragons and bleeding-hearts where the stamens are entirely inclosed until the moment when the transfer of pollen takes place.

Protection from Undesirable Guests.

If there is to be economy of pollen and nectar, means must be taken to prevent insects which would not normally effect pollination from carrying away these substances. The methods employed to accomplish this are very numerous and interesting. Peculiar folds, cushions, walls, gratings, brushes, and thickets of hair guard the entrance of the flower and render access difficult to all but the desired guest. Large and powerful insects can brush these obstacles aside, but small insects find this impossible and must climb over or circumvent the obstacles. In many cases this enforced divergence by small insects is sufficient, as they are unconsciously led past the anthers and stigmas. Many plants produce nectar in glands outside the flower; and, altho not entirely proved, it is supposed that this is for the purpose of turning unbidden insects from the flowers. Ants especially are attracted to these nectararies and have been seen to fight viciously other insects in the vicinity. This by some has been looked upon as a protection to the plant. The stems of many plants are covered with sticky hairs which render difficult, or prevent entirely, the passage of creeping insects up the stem. In a species of catchfly each internode of the stem is encircled by a band of sticky material, suggesting the sticky band about the tree trunk employed in Massachusetts to prevent the gypsy-moth larvae from climbing into the tree tops. Some people think that the water contained in the leaf bases and entirely surrounding each internode in the common teasel, thru its action as a moat, is to prevent small and undesirable insects from climbing the stem. The granular waxy covering or bloom on the pedicels and calyxes of flowers has been looked upon as a protection, since creeping insects find difficulty in walking on such surfaces and may lose their footing and fall to the ground. Stiff spiny hairs about the flowers are apparently an efficient protection against soft-bodied insects and animals such as snails. The contrivances to exclude the winged insects are situated mainly within the flower. These consist of irregular tufts and plugs of wool or latticework or crowns of various sorts. In some blueberries a latticework of barbs from the anthers protect the nectar but not the pollen. In many flowers of the phlox and nightshade families wool at the base of the style protects the nectary. In the tulip the nectary is protected by hair. The opening of many flowers with a narrow tube is closed by scales or palisades of hairs. Many flowers have corolla tubes so long that only butterflies and moths can reach the nectar. This is true of many honeysuckles, the jimson weed, and others. Most closed flowers, as the snapdragon, can be entered only by such insects as are desired. Small insects are not powerful enough to push their way in, or heavy

enough to depress the lip. In the flowers of various members of the pea family, such as peas, beans, clovers, etc., the stamens are inclosed in the keel, which under the weight of sufficiently heavy insects is depressed, thus exposing the pollen. Small insects, however, can not usually effect this depression. The closing of diurnal flowers at night and nocturnal flowers by day is a protection against unbidden guests, as well as against rain and dew.

Only the general methods of protection and a few of the special contrivances are described in this article. Each plant has its own relation to these problems, either seeming to bid them defiance or exhibiting some peculiar and beautiful adaptation which renders the study of the problem peculiarly fascinating. Even these plants which seem defiant usually have their own reason for this apparent immunity.

Ithaca, N. Y.



NECTAR SECRETION

Some Observations on the Relation Between Temperature and Nectar- secretion in Greenhouses

By E. G. Baldwin

THE poet Horace said, "Even if you drive out Nature with a fork, she will come back." When greenhouse men first put glass over their cucumber vines they discovered that, tho they kept out the wintry blasts and the consequent low temperatures, they had at the same time and by the same means shut out the vitalizing agencies for pollination that Dame Nature had set to guard the perpetuation of the plant race.

So growers of early vegetables under glass soon learned to set hives of honeybees under the glass, along with the vines, thus doing away with the tedious and costly hand-pollination. That was one step back to nature again, to be sure; but, altho helpful to the young pickles, it proved very destructive to the bees. Inasmuch as it is vital to the greenhouse owner, that his vines be freely visited by the flying bees, it will at once readily appear, that it may not be sufficient merely to have bees in greenhouses, but to have bees visiting the flowers of the cucumbers while the blossoms are open. Therefore it is very important to determine the conditions most conducive to the flight of the bees while they are under glass, and the best means of getting full efficiency from them. It is a question of dollars and cents. It seems to be one also of dollars and sense! For it is an axiom with cucumber growers in greenhouses that "Cukes from little pickles grow; and no bees, no pickles setting." In a subsequent article we shall try to show some of the difficulties experienced in getting fullest efficiency from the bees under glass in the spring of 1920. The present interest centers in some observations made during the latter part of March of the year named, regarding the relation of temperatures to nectar-secretion.

All the temperatures here recorded were taken at hive level in the greenhouses, that is, about two feet from the ground. They were taken by the best tested thermometers, the

night records being taken from Bristol's recording thermometers. The notes were made daily, often twice daily. It was the aim to mark the mini- preceding night, the actual temperature at the time of observation, the rapidity of the rise or fall in temperature, the amount and kind of nectar in the nectaries of the blossoms, and the amount of sunshine then and during the time just preceding the observations. The nectaries of the blossoms examined were pulled apart, and the fleshy nectaries exposed at the base of the anthers, in the bottom of the flower-cup where the petals join the calyx. By means of a double hand-lens it was easy to note the presence or absence of nectar. While the method of thus examining the nectaries was not mathematically exact, it is believed that the eye could detect whether the nectar was more or less abundant at the time of the examinations, and whether it was dried down into crystals, sugary and white, or still liquid and oozing out of the nectaries; for the nectar in the cucumber blossom, under right conditions, is sufficiently abundant and copious to allow one to discern between dried-down sugar crystals or freshly exuding nectar; also the relative abundance of the latter. Bee-activity about or on blossoms also afforded a criterion on nectar secretion.

The observations were begun March 10, 1920, and ended March 31 of the same year. Some were taken in greenhouses with high roofs, and others in the ranges where roofs were exceedingly low; sometimes the vines were low and the aisles open; in other houses and at other times the vines were thick and heavy, making narrow and intercepted aisles of tendrils and vines.

Notes on Temperatures, Amount of Nectar, and Activity of Bees.

March 10.—Plant A.—8:30 a. m., temp. 72°F. Minimum on night previous 60°F. Bees just set in and not flying very well. Plants small and nectar not abundant. Bees worked better in Plant X in the afternoon than in the forenoon.

March 11.—11:30 a. m. Temp. 80°F. Partly cloudy. Bees flying a little, but not visiting blossoms. Bees just set in the greenhouse. No recording thermometer here. But the owner of this plant keeps a higher night temperature.

March 13.—5:00 p. m. Temp. 60°F. Cloudy almost all day. Nectar dried down to mere crystals. Bees working slightly.

March 14.—10:00 a. m. Temp. 79°F. Sun bright. Minimum preceding night at 7 p. m. 58°F. Nectar easily visible in blossoms on the nectaries, and in liquid condition. By 11:00 a. m. temperature had reached 82 and bees were still working, but the number of flying bees had decreased.

March 15.—Plant A, Range 3.—8:00 a. m. Temp. 68°F. Minimum preceding night at 7:30 p. m. 62°F. Only dried crystals of nectar in blossoms examined. Bees flitting from flower to flower freely, but not stopping to enter the blossoms; searching rather than getting. Partly cloudy. Plant A, Range 4.—8:15 a. m. Temp. 73°F. Nectar just beginning to exude in nectaries. Bees flying only slightly, but there are no normal colonies in the house. Plant X.—8:45 a. m. Temp. 72°F. Minimum preceding night 60°F. Nectar in crystals and just showing liquid. Bees working freely, and dipping into almost every blossom but not lingering long on any one. Noted, that after inserting tongue into one or two blossoms the bees halt a moment on the side of the flower and seem to wipe off their tongues on their legs or over their heads, as if to scrape off adhering substances; the nectar seems too thick and sugary. R. W. G. New Plant.—10:30 a. m. Temp. 80°F. Nectar exuding freely. Bees working fairly well. R. W. G. Old Plant.—10:45 a. m. Temp. 80°. Nectar seeming to be just starting in blossoms, bees working slowly.

March 16.—8:15 a. m. Temp. 74°F. Plant A, Range 3. Minimum preceding night, 1:30 a. m. was 61°F. Temp. rising rapidly. Nectar exuding rapidly in nectaries. Partly cloudy. Bees working well. Plant X.—8:30 a. m. Temp. 72°F. Minimum preceding night 60°F. Partly cloudy. Bees flying and gathering nectar freely.

March 17.—Plant X.—9:30 a. m. Cloudy. Temp. 81°F. Minimum preceding night 59½°F. Chart showed rapid rise in temperature from 60° to 81°. Nectar very abundant in nectaries and bees just beginning to fly. Remain long on individual blossoms. (Note.—The cloudy morning seems to have held bees back, even though the nectar is exuding freely; or the rapid rise in temperature may have made the nectar more copious; at any rate, the bees tarry longer than usual over the blossoms.) Plant A, Range 4.—11:00 a. m. Temp. 78½°F. Minimum preceding night 2:30 p. m. was 61°F. Bees working well. Partly cloudy. 11:30 a. m. temperature has dropped to 71°F. Nectar not very abundant and bees flying very little. Plant A, Range 3.—9:00 a. m. Temp. 73°. Nectar abundant. Minimum preceding night 61°F. Bees working freely. 2:30 p. m. drop of 2° to 71. Bees still working and nectar still abundant in nectaries.

March 18.—Plant A, Range 3.—8:30 a. m. Temp. 71°F. Minimum preceding night was 62° at 3:00 a. m. Bees beginning to fly freely. Sunshine. R. W. G. Old Plant.—Low-roofed houses. Vines thick. Aisles narrow. Temp. 84°F. Ventilators not opened yet. Bees dropping to ground or clustering on rafters and roofs, seemingly confused and lost.

March 18.—Plant A, Range 4.—Temp. 2:30 p. m. 90°F. at hive level. Bees dropping to ground in clusters from the glass roofs. Ventilators still closed for some reason.

March 19.—Plant A, Range 3.—8:30 a. m. Temp. 69°F. Minimum preceding night 62°F. Raining hard outside. Nectar just beginning to exude in nectaries. Bees working fairly well but not tarrying long on blossoms. Plant A, Range 4.—8:15 a. m. Temp. 66°F. Minimum preceding night 62°F. Raining hard. Nectar mostly crystals, very little in liquid form. Bees hardly flying at all. (Note.—Plant A, Range 3.—Last night the manager of this plant fumigated his ranges with Nicofume, an insecticide, for thrips on his cucumber vines. Entrances of hives were not closed nor contracted. Bees do not seem any the worse for the fumigating.)

March 21.—Plant A, Range 4.—1:00 p. m.

Temp. 94°F. Sun bright, and weather fine outside. Minimum preceding night 64°F. Ventilators opened and temperature dropped to 76° by 3:30 p. m. Bees worked fairly well all day, better early in day and late in the afternoon, when temperatures were between 70 and 80°.

March 22.—Plant A, Range 3.—8:30 a. m. Temp. 70°F. Minimum preceding night 60°F. Warm and sunny outside. Nectar showing in tiny drops in nectaries and bees working well. Worked well till 5:30 p. m. Ventilators opened soon after temperature got to 82°F. and closed when outside temperature dropped enough to keep house temperature at 80°F.

March 23.—Weather balmy and spring-like outside. Bees outside working on soft maples and flying freely. Ventilators open much of day, and bees passing out and in thru them.

March 25.—Fine weather. Soft maples and pussy willows all in bloom. Ventilators opened much of day. Bees working well, partly on outside and partly within greenhouses.

March 31.—Elms in bloom. Bees flying and working outside and in. Notes ended.

Altho these observations are fragmentary and imperfect, it seems to me that there were three recognizable factors at work in influencing the nectar secretion, namely, minimum temperature the preceding night, actual temperature at time of examination, and rapidity of rise of temperature from minimum to normal. Besides there were some factors that were not noted or recognizable at the time.

Sunshine seemed to have some effect; but it was impossible to determine whether it was the more rapid rise in temperature induced by the sun on the glass—a thing that always happened—or the actual rays in inducing better secretion. It was pretty clear from the notes made that bees did actually work better when sun shone; but it may have been partly the brightness which induces bees from the hives, whether they are outside or in. The observations seemed to indicate that the nectar in the blossoms was usually more copious when the sun shone or had been shining a little while; but that long-continued, all-day sunshine sent the temperature too high for the best secretion of nectar, or dried it up often before noon. Humidity may play a part, but no data on that were collected. All the soils were fertilized much alike for the cucumbers; and the some soil tests were available for some houses, none were at hand for the others, and so no data were attempted on that line.

Some Conclusions.

In the main the data gathered seemed fairly consistent and suggested the following deductions:

(1) A rise in temperature from a minimum to a maximum brings the nectar over into the nectaries. Owing to the night and day temperatures best for growing cucumbers, the rise was daily, and usually occurred, under normal conditions, between 7:30 a. m. and 9:00 a. m. (The cucumbers require about 60° at night and about 80° during the day.)

(2) The minimum should not be higher than 60° nor the maximum higher than 80° for the best results in nectar secretion.

(3) There is some evidence to indicate that a lower minimum than 60° is even better.

(4) A higher minimum than 62° seems decidedly adverse to nectar secretion.

(5) A higher temperature, or a longer period of a given temperature seems necessary to bring across nectar freely on cloudy days than when the sun shines; that is, bees will not work as freely, and the nectaries do not show as much fresh nectar in as short a time when the weather is cloudy as when the sun shines. In short, it seems to take longer "to get things going" in cloudy weather, even tho the artificial temperature is normal, or identical.

(6) A rapid rise from minimum to maximum brings better secretion. Not only then does the nectar come more copiously, but also earlier in the morning. As the average temperature in greenhouses rises from about 61° at 6:00 a. m. to about 72° at 8:00 a. m., and then is raised to about 80° by 9:00 or 10:00 a. m., it was easy to observe the time and the hour, with corresponding effects on the time of the bees getting out to work. Seldom did they start before 7:30 a. m., and usually not till 8:00 or 8:30 a. m. Bees normally fly out for nectar at a temperature of 65°. It was a matter of wonder to me that, tho the temperature of about 61° of the night preceding in the greenhouses was only about four degrees below the flying temperature of 65°, seldom did the bees fly out before 8 o'clock in the morning. Was it the fact that only sugary crystals of dried-down nectar were in the blossoms to entice them, and that they came out only when liquid exudation set in? It surely seemed so.

(7) On cloudy days, when bees work at all normally, they seemed to spread their gathering time over a longer portion of the day. It may be that the temperature on cloudy days did not so soon pass the optimum for nectar secretion.

(8) But little nectar exudes in nectaries of cucumbers at temperatures below 70°F.

(9) The optimum for nectar secretion, and hence for flying of bees, seems to lie somewhere between 70° and 80°F.

(10) After an optimum has been reached, a sudden marked drop in temperature slows down secretion. (Note the data on March 17, Plant A, Range 4.)

(11) A temperature of 90° or more at hive level means, of course, a much higher temperature at the roof, and hence at that temperature bees are overcome or incapacitated for work, and fall to the ground or cluster helplessly on rafters or plants unless ventilators are opened; in that case, they fly out and so escape the disastrous effects of high temperatures.

Comparison with Kenoyer's Observations.

A comparison of the data observed above, and the conclusions recorded by Kenoyer, in Bulletin 169, Iowa State College of Agriculture, 1917, "The Weather and Honey

Production," and also his Bulletin of the Iowa Experiment Station No. 37, "Environmental Influence on Nectar Secretion," are interesting, not to say convincing.

His deductions, made on the data gathered by Mr. Strong of Clarinda, Iowa, are fifteen in number, the first few of which refer to the Iowa seasons by months, to the influence of rainy seasons, and to the direction of the winds. No. 8 in his summarized conclusions reads, "Good honey months average slightly higher in temperature than poor, this being especially true of the spring and fall months." No. 9 reads, "Clear days are favorable to production of honey." No. 10 is, "Yield is best on days having a maximum of 80 to 90°F." No. 11, "A wide daily range of temperature is favorable for good yield." No. 12, "A low barometer is favorable for a good yield." No. 13, "The fluctuations in yield for a producing period seem to be closely correlated with the temperature range and the barometric pressure, acting jointly."

His deduction No. 8 means that there are for different flowers temperatures too low for good nectar secretion. In the greenhouses we found no nectar in the cucumber blossom below 60°F., but only dried-down crystals of sugary nature remaining on nectaries. Regarding No. 9, sunshine in greenhouses always seemed to accompany best nectar secretion below 80°F.; above that, it accentuated the drying up of nectar. As stated earlier, however, it is hard to separate the sunshine from some other factors favoring nectar secretion. As regards No. 10, the yield from the clovers, basswood, and smartweed is optimum at a range between 80 and 90°F. Cucumbers seem to yield best ten degrees lower, that is, between 70 and 80°F. No. 11 is especially interesting in a comparison with our greenhouse conclusions. The evidence in the cucumber nectar-secretion tests is decidedly in favor of the conclusion that a lower minimum produces better secretion than even a minimum of 60°F. The plants are usually watered about two o'clock in the afternoon; and it was noted often that the bees seldom worked on the blossoms during nor after a watering; the air in a greenhouse, after a thoro wetting down, such as is given daily, is humid and sultry, much like a midsummer day when the sun comes out after a heavy shower. Even in those houses where the watering is done under the vines about the roots, and not by overhead spraying, the effect of the great humidity ensuing always seemed to check or stop the activity of the bees and the deposits of nectar, in some degree at least. Probably accurate barometric readings of the houses under observation would be more conclusive. As to Kenoyer's deduction No. 13, about the effect a temperature range and barometric range acting jointly have on nectar production, further tests in houses under glass must be made, and will be made this year, to deter-

mine if possible what the correlation is of these two factors.

As the greenhouses shut out all winds, and the moisture on the soil is regulated and always ample, no comparison with outside conditions is possible here.

Low Night Temperatures Favor Elaboration of Sugar.

Mr. Kenoyer's conclusions are that low temperatures favor the accumulation of sugars in the stems and tissues of the base of the blossoms, while high temperatures favor the secretion of the accumulated

sugar. It is interesting to note, that one set of greenhouses were at first heated considerably higher than the houses of the remaining growers; and so long as this condition prevailed, that particular grower got much poorer activity from his bees under glass, and consequently "kicked" vigorously at first! When his attention was called to the fact, the high night temperature was lowered somewhat, after which the bees worked better, and the nectar showed more abundantly in the blossoms.

Ashtabula, Ohio.



THE term "diagnosing," when used in bee culture, applies to a method or methods of determining the internal condition of a colony

from surface indications, mainly at the entrance, and without opening the hive. In the height of the honey flow, expert beekeepers, when rushed with their work, can tell pretty accurately what colonies in the yard are or will be needing attention by a glance at the hive. The knowledge of how to do this enables the expert to administer treatment at once to colonies that would be likely to swarm, or which might otherwise begin to loaf for the simple reason that they have no storage space available.

To go thru every hive, comb by comb, in the height of the season would be impossible; and so the expert beekeeper picks out by surface indications first those colonies that need attention at one or more of his yards, then, later on, takes care of those that are in no urgent need of care.

To Determine Whether a Colony Needs Room.

Now then for the "know how." The most reliable indication of what a colony is doing or will do is the flight of the bees going in and out of the hive. If one colony, for example, has its bees pouring in at the entrance by the score, and coming out in the same way, and another one right by the side of it has only one-half or one-fourth as many going in and out, it is evident that the first mentioned is very strong and will shortly need room, even if it does not already. The last-mentioned colony may have a poor queen. It may have had poor food during the winter, or insufficient protection. As a natural consequence it will probably have only about one-half or one-fourth as many flying bees. It will not need more room, and for the time being can be allowed to take care of itself. The other colony, with its busy rush of bees

DIAGNOSING COLONIES

Some Outside Indications of Internal Conditions. Reading Conditions by a Glance at Entrances

By E. R. Root

storage space is being cramped, another super should be added. In five minutes' time one can go thru 100 colonies, laying a stick, block, or a small stone as a distinguishing mark on top of the strong fliers and heavy hives. All others he will ignore for the time being. He and his men will then proceed to examine the indicated colonies first. Later on, when he has more time, he can take care of those that are not flying strong.

At this point the beginner, at least, should make a careful distinction between the playflights of young bees and bees that are rushing to and from the fields. In the case of the former the bees will be seen flying nervously around the entrance, some going in and some flying aimlessly around in the air for several minutes near the front of the hive. When busy at work going to the fields they will fly from the entrance directly to some distant point, as soon as they rise above surrounding objects. In the same way they will come in from the field going directly into the entrance, or perhaps dropping on the alighting-board or ground near by if heavily laden.

Neither must the beginner be confused by a case of robbing and bees actually at work in the fields. When the colony is being robbed out, only one hive, or at most two or three, in the apiary will be involved. The sound of robbing is quite different from the sound of actual workers. In robbing, the bees stealthily dodge in at the entrance as if they expected to be grabbed by the defenders of the home. Real busy honest workers going to and from the fields show no such dodging or nervousness.

How to Detect Inclination to Swarm.

Another surface indication of swarming

going in and out, should be opened up. If it has little spurs of wax built along the top edges of the comb, if it is full of brood, and if, further,

is a large bunch of bees—three or four quarts of them—clustered closely around the entrance of the hive during the middle hours of the day, with only a few bees flying to and from the field. When a colony persists in doing this while other colonies are actively going to the fields, an examination will probably show swarming cells more or less toward completion.

During very hot sultry weather in the height of the flow, perhaps half of the best colonies in the apiary may have a quart of bees clustered out in front at night. This indicates nothing abnormal; for when all the field bees are in the hive there is not room enough to accommodate them and yet allow for proper ventilation.

The Presence and Kind of Queen.

There is another indication of the internal condition of the colony, and that is, the way bees carry in pollen. It used to be said that they will not bring in pollen if a colony is queenless. This is true only in part. When it needs pollen it will bring it in whether there is a queen or not. But a colony that has a good queen, and plenty of room for breeding, will require much more pollen than one that has no queen or a poor one. When it is possible to see many busy flying bees going into the hive, and a great deal of pollen going in, it indicates that that hive probably has a good queen, and that breeding is progressing in a perfectly normal manner. But when little or no pollen is coming in, and the bees are not flying much, it shows that the colony did not have a fair chance during winter or spring, or that it has a poor queen. On the other hand, the colony may have ever so good a queen; but if there is any large amount of foul brood, either American or European, there will be but little need of pollen.

Dead Brood at the Entrance.

If one can tell the difference between a young baby queen and young workers dead at the entrance he will be able to tell whether supersedure is taking place within the hive. If the old mother fails the bees will proceed to raise a number of cells. The first virgin that emerges will be quite liable to puncture the cells of all her rivals and sting them. These victims will be thrown out at the entrance, clearly indicating that some young miss is boss of the ranch.

An inspection of the entrances will likewise show, oftentimes, whether a colony is on the verge of starvation, whether its brood has been chilled or overheated, or whether there are moth worms in the hive. When several full-grown larvae or perfectly formed young bees, brown or yellow, are found dead in front of the entrance, it may indicate any one of the possibilities just mentioned. When the bees are on the verge of starvation they will not only stop brood-rearing but they will carry out their young larvae. They apparently go on the princi-

ple that they should save able-bodied living bees rather than to lose all in the attempt to raise the babies.

In early spring some of the young brood near the outside edges may become chilled. This brood will be taken out of the cells and deposited in front of the entrance. At other times, if the hive-entrance should be closed for a short time on a very hot day so that the bees are on the verge of suffocation, not a little of the brood will be overheated. That which dies will be carried out in front.

When the moth worm is present some of the brood will be destroyed along the line of the galleries made by the worms. These will be deposited in front of the entrance the same as larvae dead from any other cause.

The presence of dead young brood out in front of the hive is always an indication that something is wrong. When it is dead from overheating or chilling there is nothing that the apiarist can do, because the damage is already done; but when it is dead because of near starvation, colonies should have immediate attention. In the case of the wax moth, the galleries should be removed as soon as it is convenient to do so.

Adult Bee Diseases.

The presence of bee paralysis or of the disappearing disease can be determined by the behavior of sick bees in the grass near the entrance. Bees affected with paralysis have swollen bodies looking something like those that are affected with dysentery. Occasionally they will void a yellowish transparent fluid, but not an opaque yellow, or a brown or black substance such as appears in the case of dysentery. Bees affected with the disappearing disease show no swollen abdomens. They will run at a furious pace in the grass, some of them crawling up on spears of grass and weeds, and finally dying.

Foul Brood by the Odor.

The presence of American foul brood in an advanced stage can sometimes be detected by the odor at the entrance of a hive affected. When one finds, as he goes thru the apiary, an odor resembling that of an old gluepot, having some suggestion of spoiled meat, he would do well to place his nose near the entrance of some of the colonies. Such diagnosis for foul brood, however, is by no means reliable; but when the familiar odor is detected near a hive, all colonies near by should be examined.

Occasionally the old queen may be found in front of the hive dead. If it is during the spraying season it may be surmised that she was killed by one of the poisons used for spraying fruit trees, to kill the codling moth. The hives should be examined at once, and either a laying queen be given or a ripe cell,



HONEY EXTRACTING EXHIBITS

Extracting and Bottling Honey an Attractive Feature at the Minnesota State Fair

The beekeepers of Minnesota have their own building at the State Fair, called "Bees and Honey Building." It is a large building. The exhibits are divided into three classes: Quality exhibits, displays, and educational exhibits. The State Fair board gives prizes amounting to \$1,200 on quality exhibits and displays, and allows an extra sum for educational exhibits. One of these exhibits is the extracting exhibit. The fair board has purchased a four-frame extractor run by electric power, uncapping tables, honey tanks, heaters, and a bottling outfit. The whole exhibit is on a raised platform 20 x 12 feet, surrounded by a heavy rail. Arrangements are made every year in the spring with some large beekeeper to produce extracted honey in attractive and well-built frames. Before I went to Europe, during the war, I furnished the honey for extracting. Dr. L. D. Leonard of Minneapolis has had the contract since. The State Fair board pays for all hired help and actual expenses of extracting, and grants the exhibitor sole right to sell his honey during the State Fair week to visitors. After the fair is over all exhibitors may sell their honey, beginning Saturday afternoon.

The extracting exhibit is in operation from 8 a. m. until 6 p. m., from Monday to Saturday. One man does the uncapping, one runs the extractor, one lectures from the platform and answers questions. Two women are employed at bottling and labeling, and three or more are selling honey from an attractive counter adjoining the extracting outfit.

Two storage tanks are used, each of 100 gallons capacity. Honey is bottled from one tank while it is settling in the other.

Two problems have always been hard to solve in connection with the exhibit: First, to keep the otherwise mussy job of uncapping and handling frames, also the uncapping table, extractor, tables, floor, etc., so clean that the public is pleased to see it; and secondly, to keep robber bees from entering the building thru gates which necessarily must be kept wide ajar all day long.

The extracting exhibit has made the public in Minnesota acquainted with the nature of extracted honey and its mode of production, and has thereby removed a great deal of prejudice and improved the sales of extracted honey. The State Fair board considers the honey-extracting exhibit one of the most attractive and popular exhibits at the fair. The total paid admittance at the Minnesota State Fair in 1920 was 535,000.

Francis Jager.

University Farm, St. Paul, Minn.



A small part of the Wisconsin State Fair honey exhibit, 1920. This was a large and impressive exhibit.



FROM THE FIELD OF EXPERIENCE



GRANULATION IN BAIT SECTIONS

Effect of Minute Crystals of Honey Left in Cells from Previous Year

In May Gleanings J. E. Crane states on page 274: "If we only knew the reason why honey in sections of comb drawn the previous season is more inclined to granulate than in combs recently drawn from foundation, we might in some way avoid the difficulty and so use our last year's half-filled sections very much to our advantage."

Long ago I noticed, when partly filled sections were run thru the extractor at the end of the season and stored away without being cleaned up by the bees after extracting, that in the following spring these combs often contained minute crystals of granulated honey, and that the new honey stored in these combs usually granulated in the winter. On the other hand, when the partially filled sections were emptied by the bees in the fall, or even cleaned up by the bees after extracting there was less granulation in the combs the next season.

Probably the reason for more granulation in old combs than in new ones is that small crystals of old honey in the cells start crystallization in the new honey. Granulation of honey is crystallization.

It is well known among sugar manufacturers that when a pan of syrup is very slow to grain that the addition of a little granulated sugar or sugar dust to the boiling syrup will often hasten crystallization. In purifying some chemical salts by recrystallization it is sometimes necessary to add a small crystal of the salt to start crystallization in the liquor. A mere sudden jar will start crystallization in supersaturated solutions of sugar syrups, and in some salt solutions as well.

Having the combs perfectly dry and clean seemed to avoid granulation with white clover honey. If any honey, either comb or extracted, is kept at a fairly even temperature, and not stirred or jolted, it has always seemed to me that it is less inclined to granulate.

A. N. Clark.

Charlotte, Mich.

What constitutes a beekeeper? Simply, owning a colony or two of bees surely does not make one. To my mind a beekeeper is one who not only cares for his bees but takes some interest in the honey-producing business and the marketing of his product.

Do not be startled if I make the assertion that there are less than 2½ per cent of the number above referred to that are beekeepers. I hope I am wrong, but I have a set of facts that bear out my belief.

About two years ago we decided that our condition was almost unbearable, and about three dozen men met in Kansas City from all portions of the nation to formulate plans for the organization of a central national league or association of beekeepers. A half dozen meetings have since been held and every bee paper has given the movement publicity.

Last month the American Honey Producers' League issued a bulletin, giving its constitution, membership, personnel of committees, etc. Exactly 2280 copies could be mailed out, because 77,720 of you beekeepers had so little interest in the movement that you would not let your identity or address be known.

Why the timidity? Were you afraid we would ask you for money? You were right. We are going to ask you for some. The league needs money. If the beekeepers of America want a league that will do things they must pay for it. The American Honey Producers' League is doing great and good work. It needs and deserves your moral and financial support.

Whether your State is affiliated or not you may become a sustaining member upon payment of \$10.00 into the league treasury. Every beekeeper and affiliated interest can help. Will you do your share?

San Antonio, Tex. E. G. LeSturgeon.



NEED OF ADVERTISING

Seventy Per Cent of the City People Think Honey in Groceries Not Real Honey

National Honey Advertising, as per Gleanings of March number, page 150, by T. V. Damon, is so much like the idea I have expressed to a great many beekeepers privately that I feel like entering the scheme at once. I think all beekeepers who will take time to learn what the city people think about honey they see for sale in stores, and also to learn or notice how manufacturers advertise their product, will surely join a National Honey Advertising fund.

Perhaps 50 per cent of city people think all honey in grocery stores is manufactured or adulterated. I give here one experience I

HOW MANY BEEKEEPERS?

American Honey Producers' League Has Addresses of Only 2280; How Many More are There?

How many beekeepers are there in this country? Ever since the 1910 census the writers of beekeeping literature have referred again and again to "the 80,000 beekeepers of America." Are there that many? I am beginning very seriously to doubt it.



FROM THE FIELD OF EXPERIENCE



had while in Philadelphia awaiting a consignment of 47 barrels of honey from my bees. I saw a big display of section honey in a grocery on Market Street. While standing in front of the window looking at this honey, people passing by would stop to see what attracted me. I would ask them, "Do you think that is real bees' honey or some manufactured stuff?" Ten said they thought it was manufactured, and I asked, "Why do you think so?" They said, "Because I know they can and do manufacture it." Two who had friends that had kept bees, thought what they saw was real honey. One who had been a beekeeper thought what he saw in the window was bees' honey. One man who was a chemist knew comb honey could not be manufactured. So you see from that experience I concluded that 10 out of 14 of the city people think the honey in groceries is not real honey.

How can we hope to have people pay a reasonable price and buy often anything of which they have such a poor opinion? If you approach people to see what they think of honey, don't let them suspect you know anything about it. If you do, you cannot get their real opinion. There are but few people who know what makes different samples of honey differ in color, odor, or flavor. If the city people all knew, say, 12 to 24 of the leading facts about honey and bees (which beekeepers know), I feel sure all the honey produced in the United States and Canada would be consumed on the tables each year by or before the new crops would be offered and at a price satisfactory to beekeepers.

Let beekeepers give to a general advertising fund, say, 10 cents per colony annually. Do this to give people facts about honey. What do you say? Come! let us do business like business men! Let dealers and bottlers advertise their particular label of honey independent of the above proposition.

Pike Road, Ala.

W. D. Achord.



TO EMPTY UNFINISHED SECTIONS

Bees Refuse to Move Sealed Honey. Loss of Honey when Feeding Back

Two years ago I tried a plan on a small scale similar to the Deadman plan described in August (1920) *Gleanings* for getting unfinished sections cleaned up. I selected a strong colony, put on a super with inch starters in the sections, put a bottom-board close to the side of the hive, on which I piled four high the supers of unfinished sections and closed the entrance to the supers from the outside. Then I took a piece of 2 x 4 scantling as long as the width of two hives, hollowed out a groove on one side

after the fashion of the Alexander feeder, and put it under the back end of hive and supers so the bees could pass freely back and forth between the hive and supers.

For a short time the bees went for the unfinished sections like robbers, but as soon as they found they had it all to themselves they cooled down and refused to uncup anything that was capped over. I took away two of the supers so I could get at the other two, uncapped the honey for them, took out the sections as they were emptied, and put in others, all the time watching the super above the colony to see that they had room to store the honey. In that way I forced



Honey exhibit at the Bahia Exposition, Bahia, Brazil, 1916.

about 100 pounds of nice clear honey on to them, but it took a month to do it. By that time the nights were getting too cool for comb-building.

When I took off the super I had some more unfinished sections—about 20 pounds of honey in a 32-section super. What the bees did with about 80 pounds of that fed-back honey I will never tell you.

The plan looks good in theory, but in practice it was a failure. If I try it again I shall use unfinished sections above the colony, but in that case we would get patched-up and unsightly sections. William Cox.

Oakland, Ill.

[The patched-up appearance of sections of honey which are finished by "feeding back" can be prevented if no sections that are partly sealed are given to the bees for completion. Any that are partly sealed may be uncapped before being given to the bees. Of course, if the unfinished sections are well filled, having the cells built out full depth, it should not be necessary to uncup



FROM THE FIELD OF EXPERIENCE



them to secure well-finished sections. The patched-up appearance is caused by the bees beginning to seal the honey before the combs are fully built out, in which case the unsealed cells are elongated beyond the sealed portion of the comb when the feeding is begun. The loss of honey during the process of feeding back was excessive in this case. No doubt much better results would have been secured if the unfinished sections used for feeding had been extracted and the honey given to the bees in a feeder. When this is done, a little water should be added to thin the honey so the bees will handle it more rapidly. The faster the honey is fed, the less the loss should be during the process of feeding.—Editor.]



CLEANING QUEEN-EXCLUDERS

A Simple Method which Does Not Injure Wood-Wire Excluders

I have for years cleaned the wax and bee glue from queen-excluders by using the Root hive-tool. Lately I took home from the outyards 150 wood and wire excluders well covered with burr combs. I placed 25 on end in my wax boiler with wood slats below and put in one pail of water. In a few moments I had good steam, and, as the excluders had spaces between with the wires up and down, the steam in a few moments cleaned them like new. I took them out and put in another lot, and so on. All were cleaned much better than by any other way I had used. The wood was not in the water, and I cannot see that they are injured in the least. Never more will I clean excluders by scraping. Steam does it much better and faster. N. E. France.

Platteville, Wisconsin.



AMERICAN FOUL BROOD

Should Diseased Colonies be Permitted to Store Surplus Honey Before Treatment?

The article on page 426, *Gleanings* for July, by A. C. Ames, gives one side of the effect of handling American foul brood in the manner which he describes. It seems but fair that the other side should also be presented, and I can best do this by giving my experience.

I live within the zone of Camp Dix; and when the camp was opened a Philadelphia company secured possession of an abandoned tomato-canning house here and bottled a beverage known as "Quako," which was sold principally in camp. Eventually the sugar shortage came on and the Quako Bottling Co. was unable to secure enough sugar for their concoction, and honey by the

barrel was purchased to be used in sweetening the product. When the honey barrels were emptied they were rolled upon the freight-house platform with bunghole open, the outside sticky with honey.

I have maintained an apiary of 40 to 60 colonies of bees within a stone's throw of the freight-house platform. During the nectar dearth, which always occurs here from about July 10 to Aug. 25, the bees partook freely of what they could get (and they got plenty) from the sticky barrels, much to the disgust of the freight handlers. American foul brood promptly appeared in the apiary (not having been there previously); and the yard has gone down to 15 colonies and no crop has been secured in three years because of the disease, entailing a financial loss of well nigh \$1000, besides the great amount of labor.

Mr. Ames does not say he destroyed the foul broody honey nor boiled it to render it free from infectious germs, and I assume he puts it on the general market. It might be well for any who have thought of adopting some such plan to remember that this honey may come back to their apiary, and to have a thought for their own welfare if they do not have much for the welfare of others. Elmer G. Carr.

New Egypt, N. J.



THE THREE MEDINAS

Three Centers which Have Greatly Influenced Beekeeping

The oldest Medina (the Arabic term for town) is known all over the Mohammedan world as the "town of the prophet," or Medina-t-in-Nabi. It was from Medina that the principles of Islam were first announced to Arabia. Altho Mohammed was born in Mecca, in the year 578 of our era, he passed his childhood days in Medina, where he died at the age of 63, and was buried in his beloved city in 691. He dictated the sixteenth Sura of the Koran there, entitled "The Bees." Like every Arab, the prophet was very fond of honey; and whenever any sufferer approached him to ask him for help for his ailments the prophet always recommended honey. In later years honey was ordained even for moral sufferings. "Honey," he said, "will alone cure you if it is Allah's will."

A man suffering came seven times, as honey had not calmed his pains. Every time the prophet repeated, "Take honey." On his seventh visit the prophet said, "Drop into your honey seven pebbles taken from the hot oven." (The Arabs use a clean pebble to spread the dough on the oven in preparing the bread of life, which is sacred. "Doing this," continued the prophet, "you must be cured," and thus it was.

FROM THE FIELD OF EXPERIENCE

Mohammed believed in the infallibility of honey, and therefore wrote two verses out of the 128 which form the chapter on bees. These two alone mention bees in the following:

"Your Lord inspired the bee to build its dwelling by gathering the material from the mountains or trees and creeping plants. He inspired her to suck from all kinds of fruit, and fly about in quest preparing in its body a many-colored fluid in which salutary principles are contained to assist humanity"—a plain hint for any reflective community.

Bees were thus consecrated, and every good believer will handle his bees kindly. The only time the Moslem meddles with the bees is in the swarming season to lodge them comfortably, and in the honey harvest, when he carefully takes out a portion of the honey without touching the brood-nest. This does not mean that no Mohammedan will be rude to his bees; but they have a kind of guarantee. In consequence, all over Islam, or countries where Mohammedans have ruled for a considerable length of time, as in Spain and the Grecian Archipelago, the primitive hive is laid down horizontally, thus rendering the suffocation of bees by brimstone not impossible but at least very difficult.

The second Medina is a large town situated in a fertile district in northern Spain, in the province of Castile, and is entitled Medina del Campo. When the conquering Arabs on their way to France in the seventh century saw the beautiful district they founded this city in remembrance of the desert Medina, the far-away home whence they started. To distinguish it from the Medina in Arabia they called it the flourishing or agricultural Medina. From this center, bees, beekeeping, and the value of honey were spread over all the Iberian Peninsula.

The system of horizontal hives spread everywhere, even to the foot of the Pyrenees on the Spanish declivity.

The Mohammedan hives are still in use. Altho the Arabs left the north of Spain as early as the twelfth century, and were finally expelled from Granada in the south in the fifteenth century, these teachings were still so convincing that the respect for the honeybee and the belief in honey are now as strong as in the days of the Caliphate of Cordova and the kingdom of Granada. A Spaniard told me that there was no use in getting several pesetas (the monetary unit in Spain) for his honey when the bees have gathered all the salutary sweet for a remedy in all diseases. Pointing to his children running about the hives, "What would they do during epidemics and during cold days if we had not this remedy on hand?" Tho a Christian he seemed still impressed by the verses from the Koran which had been repeated to his Arabian ancestors for generations. He thought it sinful, likewise, to part with his bees, as they are considered to be a part of the family. The hives, he told me, were made ages ago by his grandfather.

As for the third Medina, the Root Company knows more about it, at least how it originated and took its name from the other Medinas. But has it not been another bee sanctuary whence hives, bees, and everything pertaining to bee culture have spread over a part of the dominion, as the Arabian and Spanish Medinas have influenced the Moslem world? Indeed, Medina, Ohio, has influenced the bee world—that is, all around the globe. The Medina in bee culture, or Gleanings, or Root, is all identical with bees and honey—Airline honey of the veteran beekeeper.

P. J. Baldensperger.

Oran, Africa.



Exhibit of the Riverside Beekeepers' Club at the Southern California Fair at Riverside, Calif., 1920. In addition to the display of honey, there were nearly two tons of wax, ten colonies of bees in glass hives, and several special features such as a model in miniature of an apiary and honey-house nestled in the midst of orange groves. At the back is a display of 105 varieties of honey-producing plants of California pressed and mounted.

At the bottom of the beautiful cover page of Gleanings for July is a quotation from Morley Pettit, "One of the pleasures of a beekeeper's life is the trip home from an outyard after a hard day's work." "That's so," I exclaimed, mentally if not aloud. How many times have I enjoyed these trips home, so quiet and restful, even when I had to walk up the long hills to relieve my patient horse hauling a heavy load of honey!



The method advocated by Mr. Pettit, page 412, for getting combs cleaned up after extracting is certainly simple and effective, and better than many of the plans heretofore described.

Conditions here in Vermont are not promising a large crop of honey. The weather has been very dry most of the time since May 1, and, while some yards are doing very well, others have made little more than a living.

One of the wants of beekeepers for many years has been a perfectly sure method of introducing a strange queen into a nucleus or colony. The cage and method described by Jay Smith on page 417 is as nearly perfect as we shall be likely ever to find. The idea of a push-in cage, however, is not new. Capt. J. E. Hetherington described it to me—in fact, made one for me of wire cloth 49 years ago. At that time he recommended this method as one of the safest for introducing queens.

That is a right good article by S. B. Fracker, on page 422, on "Compulsory Honey Grading." It looks very much as tho those Wisconsin beekeepers were on the right track. Such a law will give "back yard" beekeepers a jog that will set them, as well as other producers of food, to thinking. It is a fact that ought to be often repeated, that mixing a low-grade product with a high-grade rarely raises the price of the low-grade, but almost invariably lowers the value of the high-grade product.

In the first short editorial on page 409 it is stated that July is an excellent time to requeen. Not only is this true, but it is the least expensive time as well as the best time to secure the best stock, and no one has so good a chance to secure good stock as the honey producer himself. It is a comparatively easy matter to notice the great difference in a yard of bees in the storing of honey. In a yard that will average 40 pounds of surplus honey, we are quite sure

to find one or two colonies that will store 80 or 100 pounds of surplus honey. How easy to rear one or more sets of queen-cells from such colo-

nies, to replace queens in colonies that have proved the least productive!

"Leave more honey for the bees," says the Editor of Gleanings, page 410. Certainly good advice where a yard is run for extracted honey, and worth remembering when run for comb honey. We had colonies starve last year in outyards that we used for section honey before we got around to feed them for winter. There was an unusual dearth of honey the latter part of the season.

"It is up to the beekeeper," says F. C. Stahlman, page 429, and he is right. The crop of honey will depend much more upon the beekeeper than we are apt to think. I was recently visiting some beekeepers in the north part of our State, and while I found some yards with strong colonies, other yards were comparatively weak. While the strong colonies were storing surplus, the weak ones were busy filling their hives with brood, and will store very little surplus unless there should be a good flow of honey late in the season.

A. C. Ames, on page 426, gives to those who are trying to overcome American foul brood some excellent advice which all may adopt with very decidedly satisfactory results. But European foul brood! This is indeed the "pestilence that walketh in darkness" and "wasteth at noonday." You can scarcely tell whenever it comes, or where it is going to turn up next. There seems to be a good many exceptions to its general methods of development and disappearance; but one thing seems pretty certain, that with strong colonies of Italian bees we can fight it successfully.

That estimate of Mr. Demuth, on page 410, of the average amount of comb and extracted honey secured by colonies of equal strength is most decidedly interesting. I have been satisfied for some time that the early estimates of two pounds of extracted to one of comb were quite too high. A beginner extracting honey before it is well ripened or some one having a somewhat peculiar location like the Dadants, or a heavy late flow, may secure two pounds of extracted to one of comb. I believe those who extract leave far less, as a rule, in the brood-chamber than those who work for section honey.

MORE perhaps than any other branch of agriculture, beekeeping has a generous list of great and beloved names folded down in its

chronicles. Even after laying aside the thought of literary sideliners like Virgil of old and Maeterlinck of today and others like them (are there any others like them, tho?—will there ever be?), men who have immortalized the charm of the bee, there are still practical apiculturists, experimenters and scientific investigators whose names are dear to the entire beekeeping fraternity.

From among them all, could only one be selected for a sketch who would not choose the great Swiss naturalist—blind Francois Huber? It is good to renew, in even the small measure of such an article as this, our acquaintance with this dauntless soul.

He was born in Geneva, Switzerland, in 1750. What a city and what a time for a scientist to be born in! Horace Benedict de Saussure, the eminent Swiss physicist and geologist, who at 22 years of age accepted the chair of physics and natural philosophy at the University of Geneva, was a romping boy of 10 years when Huber, his future famous pupil, was born. Charles Bonnet, another great Swiss naturalist and philosopher, was 30, but he guessed no more than the boy De Saussure how great and dear a friend was born in his own native city that day. This was the same Charles Bonnet who had startled the scientific world 10 years before, when only 20, with a paper on aphids, in which parthenogenetic reproduction was first described. No wonder this achievement made him, young tho he was, a corresponding member of the French Academy of Sciences. This was a full century before Johann Dzierzon, the pastor of Karlsmarkt, grew from a sideline beekeeper into a special student of apiculture and with the aid of his detachable cells discovered the parthenogenetic origin of drones.

Huber's own family was well-known and wealthy. He probably never remembered his great-aunt, Marie Huber, for she died when he was only three years old; but she was a literary woman of wide interests, not only a tireless writer on religious and theological subjects, but also the translator of the Spectator. Then there was another relative with a fine chemical laboratory, who, alas, could not, even in the modern, progressive, scientific spirit of the Geneva of the mid-eighteenth century, lay aside his stubborn belief in alchemy. How long and patiently they labored, those old alchemists! And there was the boy's own father, Jean Huber, from whom he inherited his deep love of nature and keen powers of observation.

Beekkeeping as a Side Line

Grace Allen

What a brilliant, gay, light-hearted, charming and likable gentleman this Jean Huber must have been. Known as a wit, he had also many and varied

talents—he was a poet and a musician, a painter and a sculptor, and he served for many years as a soldier. But he took life lightly, tossing the hours about like brightly-colored balls to be played with, and so made no lasting mark in any line, tho his "Observations on the Flights of Birds of Prey" won him considerable reputation. However, he was doubtless a delightfully entertaining daddy. What music he could make! How he loved the out-of-doors and what fascinating things he could discover there and what secrets he could then tell about them! What strange and splendid specimens he had collected! And what miracles he could perform with a piece of paper and a pair of shears! Indeed, the cutting out of landscapes and silhouettes from paper became such an art in his hands, that he may fairly be called its originator. How he must have amazed and delighted grown-ups as well as children that time he tore a profile of Voltaire from a card with his hands behind his back—and that other time when he broke his own record by so skillfully guiding and turning a flat piece of cheese that his cat ate out therefrom another profile of Voltaire! Fortunately only his brilliance and talent descended to his son, and not the undue levity that undoubtedly marred his own career.

This father's library, his cabinets of specimens and his rich observations roused in the boy an early and unceasing love of nature, which was well developed into methodical observations at an age when few children have learned to observe at all. Then there were also the usual social activities of the children of such families, and young Francois was sent to dancing school. So, too, was little Marie Lullin, whose father was one of the Magistrates of the Swiss Republic. They became childish sweethearts, these two. But oh, how little their child hearts guessed, as they followed the steps of their dancing master, the greatness of the tragic days to come.

From early childhood Francois attended lectures at Genevan College. Before he was 15, he had completed a course in physics under De Saussure. He had familiarized himself with chemical manipulations in the laboratory of the old alchemist. But a too intense and steady application to his studies and the habit of constantly reading late into the night by dim lamplight or dimmer moonlight seriously injured his health. At fifteen, he broke down, utterly prostrated and threatened with blindness. His terrified father—all gayety forgot—rushed him

to a famous doctor in Paris who ordered him to the country. Near Paris is the quaint little village of Santi, and here the boy Huber ploughed and sowed and milked and lived the life of an ordinary peasant lad. His youthful strength rebounded swiftly and he returned to the city with vigor completely restored. But there another doctor, a celebrated oculist, broke to them the solemn news that his eyesight could not be saved. Slowly but surely he was to become totally blind. One eye had the same disease that had "quenched the orbs" of Milton—amaurosis; the other had cataract, which the doctors were unable to cure. Francois and his father went back to Geneva. And the boy went bravely on.

The childish love between Francois and Marie was deepening with the years, and now his only fear was that his affliction might alienate her. So he constantly minimized its seriousness, ever to himself, scarcely admitting its steady desolating development. He talked always as tho he could see perfectly, and so formed the habit, later carried so noticeably into his writings, of speaking about seeing with perfect clearness what he saw only with the inner eye—altho there certainly with perfect clearness. But he need not have worried about Marie. Her affection was so deeply rooted that not even her father's bitter opposition, which at times amounted to persecution, could turn her from this great-souled young man who was so soon to pass into complete outer darkness, but who held so bravely and steadily to the stronger light within. As soon as she reached her majority she married him, shortly before he became totally blind. The tender devotion that brought her to that shadowed altar made beautiful 40 years of married life. She was at different times her husband's reader, his secretary, his observer; and was always closely absorbed in the work that absorbed his attention. When he was an old man he once said, "As long as she lived I was not sensible of the misfortune of being blind."

Another close personal association came to Huber thru Francois Burneus, whom he first employed as a servant. Soon, however, the keen inner sight of the master had discovered in the man those rare talents that make the skillful observer. So Burneus became his invaluable and highly trained assistant in working out his one life purpose, research into the life and habits of the honeybee, displaying remarkable patience and skill thru countless experiments and under literally thousands of questions, by which Huber guided, directed, sifted, and tested his efforts. In one experiment to learn something about laying workers, Burneus caught one by one every bee in two hives which were suspected of having laying workers. This required 11 days of steady work, during which time he stopped only long enough to rest his eyes (the pathos of the master's insistence upon this!), Huber

gave public testimony to his worth, insisting upon sharing his own honors with one who "counted pain and fatigue nothing compared with the great desire he felt to know the result."

The results of Huber's observations and his long extensive investigations were written as letters to his famous naturalist friend, Bonnet, whose own sight was failing so that he had given up his active scientific investigations and was devoting his later years to philosophy. When these letters appeared later in book form as "New Observations on the Honeybee," some scholars at first raised mental eyebrows and smiled doubtfully at observations conducted by a blind man assisted by a peasant. But that attitude could not last. Scientists are necessarily just and honest, and these swiftly threw aside their first prejudice and accorded to Huber's book the great place it still holds after the passing of all these years.

He wrote in a wonderfully lucid style with lively picturesqueness—clearness of phrase growing out of clearness of vision, inner vision. His work is marvelous in its accuracy and fullness. Boundless patience and infinite skill unearthed hidden truths for him that had been searched for in vain for generations, from the seekers of ancient days on down to his own eminent friend Bonnet.

He built the first observation hives—one for a single comb and others for several combs, opening like books with hinged leaves, each leaf containing a comb. Among his important discoveries are the fertilization of queens in the air, the development of the eggs of an unmated queen into drones, the rivalry of queens, the origin of propolis, the origin of wax, the ventilation of the hive, and facts about the antennae and laying workers and swarming and different senses.

Huber's mind was strong and active. Like his father, he loved music. He had mastered counterpoint, and could build the harmonies of a musical composition when the bass was dictated to him. After one repetition it was his own. He invented a printing machine on which he corresponded with his friends. He loved to walk in the open air, and arranged to have knotted cords strung along the rural walks around his home, so that he could follow these paths without other assistance, and know his whereabouts by the knots.

While he had every advantage that ingenuity and wealth could bring, coupled with the tenderest devotion and quickest sympathy with his work, all of which helped to bring light into the dark days, yet the real source of his serenity lay in his own strong unshrinking soul. To old age he retained a deep affection for his friends, boyish ardor, steady delight in nature, noble enthusiasm, and that sure sympathy for youth which keeps age young. His mental

(Continued on page 524.)



FROM NORTH, EAST, WEST AND SOUTH



In Ontario.—For the last 10 days Ontario has been sweltering under a hot sun, temperatures running from 90° to above 100° in the shade each day. Today (July 8) the heat wave is broken, temporarily at least, by terrific downpours of rain, some three inches falling at our place, and grain in the fields is all as flat as tho a roller had been run over it. Farmers as well as beekeepers have their misfortunes to contend with, and it is hard lines for the farmer to see so much damage done when a few hours before the prospects looked very bright. Some of the grain may rise again, but the heavier fields are tangled so badly that much of the grain will stay where it is till cut. So far as the beekeeper is concerned, probably the heavy rainfall may be a benefit; but that is yet to be proved, as we have had a heavy honey flow ever since the heat wave struck us.

In my last batch of notes attention was drawn to the rather gloomy outlook at the time of writing, but the unexpected has happened again and it looks like a fair crop of honey for Ontario this year. True, some localities report failure; but, on the other hand, other localities have had very heavy yields.

A few days ago I took a hurried auto trip to our apiaries in Wentworth County, and while there I was again forcibly reminded of the uncertainty of beekeeping, and how great are the differences of results in different localities one year with another. Quite a lot of writing has been done relative to the pound-package business, and beginners at least are apt to be misled by conflicting reports. The report I am about to make will merely emphasize the matter of locality and seasons—more particularly the latter—as to how beekeeping is affected by these two factors.

Early in May of this year some two-pound packages were shipped to our Wentworth County apiaries for the purpose of making up a loss of a year ago at one yard at that center. The weather was bad when my son went over to put the bees into the hives at that place, and he brought home a few which were put in the home yard. All came by the same post and from the same shipper and all were alike as to condition. When at the Wentworth County yards a few days ago I noticed that all the package bees placed there had an average per colony of at least 100 pounds of clover honey piled on them. The package bees here at the home yard are not more than ready for the supers yet. Last year these two localities were in just the opposite condition, being very backward at the Wentworth County yards and abnormally developed early in the season here at home. It is only 65 miles in a direct line between the two localities, but what a difference!

Friend Pettit in the last issue of *Gleanings* gives splendid advice to the producer of extracted honey in more than one way, and one almost envies him the splendid equipment which he has to work with. In the number of supers of drawn combs necessary to take care of the crop in a good year, particularly where a number of apiaries are being operated, he does not at all exaggerate the importance of having a large number of drawn combs or foundation in frames, ready for an emergency. This year we have been taught a very expensive lesson along that line, so I can speak from experience. At one set of apiaries where there are some 400 colonies in five yards, we had a little less than an average of three supers of drawn combs per colony. Last year with a light crop at that place, not nearly all these combs were used, and it was a problem to keep them clear from moths. But this year, following a very light flow early in clover bloom, all at once a veritable flood of nectar was coming in at that place, and in 10 days all supers were on the hives and soon all were plugged. It was impossible to get out supplies on short notice, and with all colonies to be examined to head off swarming, one can imagine just what happened. Extracting was started at once from the top stories; but, for every pound taken off, the bees would have stored at least two pounds if they had had room, since they were very strong and the flow still kept on. I will not soon forget my impressions as I visited all five yards and saw literally bushels of bees covering the high stacks of supers from the top to the very bottom of the hives. Most of them were loafing, as they had no place in which to store any more honey.

This lot of bees are run on the central-extracting-plant idea, and while it has many advantages, I still think that, if we had an extracting outfit with buildings at each place, faster time could be made in extracting in an emergency like this. I think it is no exaggeration to say that, if we could have had five supers to each colony instead of three, at least 15,000 pounds more honey would be to the credit of those bees. That amount of honey even at a low price would buy a lot of supers and foundation even at the high price they are selling. This is not apt to happen again for some time—I mean the flow of honey may not be so free for years to come, yet for this year the extra supers would have paid handsomely, and one would not be feeling that because of being unprepared a fair crop was lost.

While the flow was good at that place, here at the home district where we have eight apiaries, almost no honey came in during most of the alsike bloom. The bees did not build up to normal strength as compared with other years, and they were not ready



FROM NORTH, EAST, WEST AND SOUTH



for the flow when it did come. After all thoughts of a white honey crop were about dismissed for this season at this place, all at once the browning alsike clover and the sweet clover, just in its prime, began to yield, and, if the bees had been up to their usual strength, we would have been able after 10 days of a flow to report a fair crop. As it is, strong colonies are reaching the skyscraper stage and if the flow keeps up for two weeks longer we may yet get a nice crop here.

Buyers and sellers of honey are both in a quandary at the present time as to how prices will rule for the season. A few days ago a representative of one of the big firms talked with me over the phone, and after some of the usual preliminaries he said, "What are you asking me for the crop this year?" I replied, "You fellows usually bid instead of asking for a quotation, what are you offering?" His reply was something like this, "I haven't the slightest idea what I should offer," and I had to confess that I had no idea what I should ask. Naturally no business was transacted, but there was a mutual understanding that as soon as we knew where we were, we would talk the matter over again, and possibly something more substantial would be accomplished. It is a very peculiar situation, to say the least, and there are likely to be wide differences of opinions between beekeepers as to what prices should be, not to mention the matter of the different viewpoints of producers and buyers of our product. J. L. Byer.

Markham, Ont.

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In Southern California.—Reports from the various sections of southern California for the past month change the forecast of our last report but very little. There was a period of several weeks just following the orange flow during which very few apiaries were able to hold their own, and many lost from 10 to 15 pounds per colony. Then the white sage, deerweed or wild alfalfa, and some other plants began to yield enough so that the bees could make a living. Now (July 3) the wild buckwheat, sumac, etc., are yielding very well, and it may be that some beekeepers will be able to get a little surplus honey from these. Reports from the purple sage country—northern Los Angeles and Ventura counties—are much more encouraging and some surplus is expected from that source. That section got from four to five inches of late rainfall, which accounts for their promising condition. The mesquite and alfalfa ranges will make about one-half of a crop. Beans will be late, as many of the farmers had to plant a second time to secure a stand.

Bees do not sell as readily as they did a year ago, and good apiaries have been sold

lately for about half what they would have brought at that time.

With the crop one of the smallest in the last 12 or 15 years, prices are not at all encouraging, and buyers are not anxious to buy. The carry-over of last year's honey is quite heavy, and this combined with a lower price is not the most encouraging condition for the average beekeeper. Prices of supplies are declining, so that things will in time get down to a proper level again. All lines of produce are in the same condition out this way, and only time will even things up again.

Different opinions exist as to the results from our three years of the Exchange method of handling the honey crop. Perhaps no more trying three years could have been chosen in all of the history of California beekeeping to try out this method of marketing the honey crop. Outside buyers have paid all the way from 20½ cents down to 10 cents for last year's honey.

Some members can see only the very few who sold at the high figures and cannot see the great majority, many of whom have since sold at the lower figure. It is easy to sell on a rising market, but oh, the vision of "What I might have done!" It was very little honey that sold around 20 cents, which fact is easily proved by the weak market at that time, as the Exchange was ready at all times to fill all orders at the high prices. Some members are sure to be dissatisfied, but the majority seem to feel that they have received as much for their honey or more than they would if they had not been in the Exchange. Many are ready to sign up for a new period of several years. Some of the California exchanges have made new contracts for as long a period as seven years.

With markets established, brands of honey recorded, headquarters, offices, repacking equipment, etc., belonging to the Exchange, our future is certainly bright. Our short crop this year is very discouraging, as it is always more satisfactory to produce a big crop even if the price is not so good. As intimated in our last report, most beekeepers can look back and see where some of the money for last year's crop could have been saved and used to very good advantage in getting thru this short crop.

Corona, Calif.

L. L. Andrews.

* * *

In Texas. It is often said that Texas is the too State! it is too wet or too dry or too hot or too something. It was too cold and dry all spring and a honey crop was despaired of; but June came hot and dry and then a big rain and more heat and sun, and now we have too much honey. The horsemint was almost gone when the rains came, and now it is in fine shape and yielding heavily. The mesquite



FROM NORTH, EAST, WEST AND SOUTH



had just commenced to bloom, and every one expected that this would put an end to the honey flow. Mesquite, true to habit, did put out new branches, but with them came new blooms, and almost all of the mesquite country has had a flood of honey. So heavy in fact that, while less than a month ago the crop was 75 per cent below normal, it is now up and in some localities above the average yield.

Locality is brought out very forcibly in this mesquite flow. Small areas within the mesquite country failed to bloom at all. Just what the cause was is hard to say. The soil is the same, the rainfall was similar, and the age of the trees the same. The only explanation that has been suggested is that these trees bloomed heavily last year.

A questionnaire answered by several hundred beekeepers shows that this year's mesquite ranks first in yield of honey and horse-mint second. Last year the reverse was true. Cotton, however, may rival mesquite. It will be October before I can report on cotton.

Prof. S. W. Bilzing and Dr. M. C. Tanquary, who will have charge of the entomology work at the short course at the A. & M. College, July 25-29, have the arrangements made for the Beekeepers' School July 26-28. A notable feature of this school will be the number of auto trains that will bring the beekeepers to the school. One train of ten autos will go from San Antonio, one of like size from Palestine, and one from Temple. A large number of smaller groups are being planned from various beekeeping centers. It is hoped that these overland trips of well-decorated cars will stimulate the interest in beekeeping and the sale of honey.

The influence which the bees have on the

beekeepers is rather remarkable. We often wonder and try to explain why the bees rush around the hive, get out and "wash-board," and do other of their strange actions. We wonder what the bees get out of our performances. A month ago we were rushing from hive to hive putting in feed or making increase, and now we are wildly running from yard to yard, jerking off supers and otherwise mussing up the colonies. What do you suppose the bees discuss in their trade papers?

Very little attention is paid to the smaller plants, growing in swamps or water, as a source of nectar. In 1914 I found water willow, *Dianthera americana*, to be a very important factor in the white clover honey crop of many sections of Missouri. Because of its habit of growing in the water it is not affected by dry weather and has a continuous daily honey flow. Here in Texas, even tho the climate is supposed to be semi-arid, there are swamps, rivers, water holes, and "tanks" all abounding in nectar-bearing plants which bloom during nine months in the year. Pond lily honey has been reported in large quantities. The blue-flowered pickerel weed, *Pontederia cordata*, the arrowhead *Alisma* and *Sagittaria*, several species, water purslane, *Ludwigia* sps., and a number of others add a very large amount to the Texas honey flow.

The experimental queen-yard belonging to the State Experimental Station is producing a fine lot of queens. This yard was established last year and is producing more and better results than were expected. Under the guidance of L. R. Watson, State Apiculturist, and A. H. Alex, queen-breeder, the yard is delivering the queens almost as fast as they are ordered. H. B. Parks.

San Antonio, Tex.



Educational exhibit by the extension division of the Mississippi Agricultural College, at the Mississippi State Fair.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Several Wait two days after removing the
Timely old queen before introducing ripe
Hints. queen-cells. Fifteen days later
look for eggs.

Bees that are to be united with another colony should have their queen killed two days previous.

Nail two pieces on the escape-board to guide bees to the escape; the super will be free of bees much sooner than without the guides.

The young virgin queen not long from her cell does the piping. Her note is higher than the queen quacking in her cell.

East Avon, N. Y. A. C. Gilbert.

Catching Queens After having had considerable trouble in catching a queen to clip her wings I now get her legs tangled in honey to prevent her from chasing from one end to the other of the frame, which is very irritating to the bees. I have some honey in a small bottle ready to pour over her, and find it a very good and simple way to handle queens to clip their wings. Another advantage of covering them with honey is that it avoids leaving the scent on the fingers, and so assures their safety in placing them back on the frames.

Fall River, Mass. Delphis A. Lagasse.

Removing Escort I do not know whether it
Bees When ever occurred to you that
Introducing. escort bees with their queen may cause some disturbance when attempting to introduce. Rarely, indeed, have I ever seen an escort worker left even when the queen is accepted; so by removing them before introducing we eliminate that danger. With the success we have had in introducing queens without escorts is it not possible that the bees will be more ready to accept a queen if there are no strangers with her? E. J. Ladd.

Portland, Ore.

Value of Shade If the beekeeper only
for Bees. knew what it costs to leave his bees out in the hot summer sun without shade-boards, also the risk he runs from the combs melting down, he would use shade-boards on every hive.

I make my shade-boards from four shakes bound at each end and in the middle by lath.

Only a few years ago thousands of colonies of bees were destroyed in southern California from heat, and beekeepers should be prepared to meet this condition at any time, for Nature has a way of repeating herself every few years. A. E. Lusher.

Pomona, Calif.

Requeening With Two years ago, during
Virgin Queens. the honey flow I killed my old queens in the afternoon, smoked in young ones about dusk, and had 80 per cent accepted. The past season the flow was very light, and I tried the same method, but it was almost an utter failure. I noticed in Gleanings a method in which the queen was caged on top of the brood-frames for 24 hours, then removed, and a young queen put in the same place, with the cage plugged with candy. I tried this method for the remainder of the season and never had a failure. I used a wire cage, three-eighths of an inch thick, laid flat over a space between frames under the excluder. In some cases the bees built cells and capped them, the young queen laying all around them, but these were all destroyed by the bees before time to emerge. I shall certainly continue to use this method unless the bees act differently the coming season. Thomas Martin.

Wanstead, Ontario.

Simplified My apiary of 56 colonies is
Management. located on the banks of the Canadian River six miles from where I live. Last year these colonies produced an average of 55 pounds per colony, so it will be seen that production here is not large but it is reasonably dependable. We give no winter protection, usually leave one deep super on with plenty of stores in it, and in the spring the hives



are boiling over before the honey flow begins, which is from alfalfa and sweet clover. The alfalfa honey flow begins early in June and all is over by the middle of September.

In the spring as the bees need room we just add those deep supers and let them ramble. We clip all queens in the spring and visit the bees once or twice a week. When the season is over we extract once for all, this usually being done in October.

We sell all of the honey here in fruit jars and ten-pound friction pails.

Choctaw, Okla.

Eugene Couch.

QUESTION.
—Is anyone
so accom-
plished in
in the handling of
bees as to be im-
mune from stings?
Oliver M. Fisher,
Illinois.

Answer.—No.

The careful operator who understands the behavior of bees in defense will receive fewer stings than the operator who is nervous or careless, or who is not acquainted with bee nature, but no one is immune from stings. While apparently the bees are no respecters of persons and will treat all operators alike if the operators behave in the same manner toward them, yet there is a difference in the way they treat different persons which cannot be explained by their actions or dress. Of two careful operators working side by side one may receive twice as many stings as the other during a day's work among the bees. Some think this is due to a difference in the odors emanating from their bodies.

WORK OF QUEENLESS COLONIES.

Question.—Do queenless colonies gather honey just as freely as queenright colonies?

South Dakota.

E. T. Frey.

Answer.—Usually they do not gather with quite the same energy and sometimes queenless colonies become quite sluggish even during a good honey flow. The difference in the amount of honey stored by a queenless colony and a queenright colony of the same strength may not be noticeable when producing extracted honey, but it is much more noticeable when producing comb honey. Queenless colonies do not build comb readily and are inclined to store in the brood-chamber instead of in the supers.

INCREASE AND SURPLUS OF HONEY AT SAME TIME.

Question.—Since you do not advocate natural swarming, how may a beginner increase his number of colonies and get some surplus besides?

West Virginia.

C. E. Thompson.

Answer.—Much depends upon the time of the main honey flow. Where it begins just as the colonies have built up to full gathering strength in the spring or early summer, increase cannot be made before or during the honey flow without interfering with the production of surplus honey, unless it is made from brood and young bees that come on too late to take part in gathering the crop. Thus in either natural or artificial swarming during a short honey flow increase can be made without a loss in the amount of surplus, if the parent colony is set at one side of the swarm for a week and then moved to a new location (see page 299, May issue), for when this is done only the youngest bees and the emerging brood are left in the parent colony. If the honey flow closes within two weeks these young bees in the parent colony would not have been able to do much toward increasing the surplus, if the division had not been made. Utilizing the same principle where the honey flow

GLEAINED BY ASKING

Geo. S. Demuth

closes in July it is possible to divide colonies at the close of the honey flow, making two or more from each; but in this case it will be necessary to supply

each division with stores, for there will not be enough honey in the hive at the close of the honey flow for two colonies. Colonies may be divided even as late as the first of August if each division is given an ample amount of honey. Where there is a fall flow, colonies divided at this time may be able to build up and secure enough honey for winter, but otherwise it will be necessary to leave each division five or six full frames of honey.

PARENT COLONY FAILS TO DEVELOP LAYING QUEEN.

Question.—I have had considerable trouble with the parent colony's failing to develop a laying queen after moving it to a new stand seven days after the swarm issued, as described on page 299, May issue of *Gleanings*. Could this be because the parent hive was moved away while the queen was out on her mating flight?

D. E. Scott..

Tennessee.

Answer.—Since the bees usually swarm at about the time the first of the queen-cells are sealed, the young queens do not begin to emerge until seven or eight days after the issuing of the swarm. In addition to this the young queen does not go out on her mating flight until she is several days old. From this it will be seen that if all goes according to the normal schedule, there is no danger of any young queens being lost by moving the hives away on the seventh day. If the issuing of the prime swarm is delayed by adverse weather there is a possibility of some young queens being lost when the parent hive is moved on the seventh day; but in this case the beekeeper, knowing that swarming was delayed, should move the parent hive away a day or two earlier. Ordinarily there is but little if any danger of young queens being lost in this way. There are plenty of other ways by which young queens may be lost to explain your trouble in this respect.

AMOUNT OF CARBON BISULPHIDE NEEDED.

Question.—How much bisulphide of carbon should be used on each pile of five hive-bodies of empty combs and how often?

W. S. Chapel.

Vermont.

Answer.—About two ounces should be ample for five ten-frame standard hive-bodies, provided they are so piled that the gas from the carbon bisulphide cannot readily escape. It should be remembered that, as carbon bisulphide evaporates, it forms a gas that is heavier than air. The liquid should therefore be in a shallow pan or saucer placed in an empty super on top of the pile of hive-bodies. A cover should be placed on top of the empty super, and the whole pile should be made as tight as possible to confine the gas. A second treatment two weeks

later to kill any larvae that may have hatched from eggs that were present at the time of the first treatment should be sufficient for the safety of the combs, provided they are kept where moths cannot get at them. You can have these combs taken care of by the bees without the necessity of any fumigation by tiering the hive-bodies filled with combs over strong colonies. One strong colony can take care of five or six sets of combs or even more.

SACBROOD AND THE SO-CALLED PICKLED BROOD.

Question.—Are sacbrood and pickled brood one and the same thing? H. B. Shollenberger.
Pennsylvania.

Answer.—Sacbrood is the name now applied to the brood disease formerly called by some pickled brood. The term sacbrood suggests the sacklike appearance of many of the dead larvae in this disease. It is not so destructive as American foul brood or European foul brood, and it is somewhat transient in character usually disappearing of its own accord, especially after midsummer. Altho this disease sometimes so weakens the colony in the spring that it is unable to store a surplus of honey, it is usually not necessary to give any treatment other than to see that such colonies have a good queen and sufficient stores.

COST OF EXTRACTING HONEY.

Question.—What would you consider a fair price to charge for extracting a neighbor's honey if he helps me take it off the hives?

Pennsylvania. Robert L. Cooke.

Answer.—If there is only a small amount of honey to extract one cent per pound is probably a fair price, for there would be some loss of time in preparing for the work and cleaning up afterward. When a large amount is to be extracted and a large power-extractor is used, it could be done for less.

SUPERS AND AMERICAN FOUL BROOD.

Question.—Would it be safe to use supers of sections filled with full sheets of foundation with here and there a section of drawn comb but empty that had been on a colony having American foul brood?

C. W. Horner.

Answer.—No, it would not be safe; but, in actual practice, a careful beekeeper could do this without many cases of a recurrence of the disease.

DISINFECTING HIVES BY BOILING IN SALT WATER.

Question.—Is it safe to disinfect hives that have housed colonies having American foul brood, by boiling them in a strong solution of salter water?

New Mexico.

J. H. Sinclair.

Answer.—Yes, if they are boiled long enough to kill the spores of the disease. The addition of salt should not be necessary, however, for the heat will destroy these spores if kept at the boiling point for a half hour. The salt solution would have a higher boiling point than pure water, which would reduce the time necessary to kill all the spores. Perhaps 15 minutes would be ample. A serious objection to boiling the hives is that it causes the wood to warp and twist badly. Flaming the inside of the hives lightly with a painter's torch will render them safe to use again. After

all, the important thing is to have the hives well cleaned on the inside so there is no possibility of even the smallest drop of honey on them.

REMEDY FOR MOTHS.

Question.—My bees have moths in their combs. What can I do?
Texas. Marion Rowe.

Answer.—If you keep Italian bees and see that the colonies do not become weakened by lack of stores or disease, the moths can not harm them. Moths are not able to breed in the combs of strong colonies of Italian bees, but they quickly take possession of any combs not protected by bees. When moth larvae are found in the hives, it is advisable to find out what has caused the colony to become weak, for sometimes one of the brood diseases gets a start in the apiary without the beekeeper's suspecting any trouble until the moths begin to take possession of the combs. For this reason you should examine the brood carefully in these colonies to see if any of it is dead or discolored, disease being thus indicated.

QUEENS LAY SEVERAL EGGS IN ONE CELL.

Question.—This spring I found some of my queens laid two eggs in many of the cells, and in one cell I found three eggs. Are these queens all right?
Wisconsin. H. V. Howard.

Answer.—These queens are probably all right. It is not unusual for a good prolific queen, whose colony is not strong enough to take care of a large amount of brood, to go back over her work and lay a second or third egg in many of the cells. As soon as there are enough bees to cover more brood such queens again lay regularly. It is not difficult to tell from the position of the eggs whether the queen is normal. Drone-laying queens and laying workers sometimes lay many eggs in a cell but place them in irregular positions, sometimes even on the walls of the cells instead of on the base.

DISINFECTING HIVES WITH KEROSENE.

Question.—Is it possible to disinfect hives by painting them on the inside with kerosene to kill the spores of American foul brood?
Oklahoma. K. Hurst.

Answer.—Kerosene is not used as a germicide and would probably not destroy the spores of American foul brood altho it might tend to dissolve the external covering, thus weakening their resistance. Until someone definitely proves by experiment that these spores are actually destroyed by a coating of kerosene it will be advisable to use some other method. If American foul brood does not reappear in hives that have been treated with kerosene, this can not be taken as proof that the spores have been killed; for if the walls of the hive are absolutely free from honey, there should not be many cases of recurrence of the disease even when the hives are not treated. The application of heat, either by live steam or by lightly scorching the inner walls of the hives, is doubtless safer than painting them with kerosene.

THE surplus honey season is over here. We have one-third of a crop generally. Many have taken the honey before ripe. I have not extracted much, rather let bees ripen it first.”
—N. E. France, Grant County, Wis.

“The crop is a practical failure here so far. It seems as tho the bees go down, and there is a shortage of bees. We had big losses in the flood. We may get honey later, but prospects are not very good.”—Bert W. Hopper, Otero County, Colo.

“I am 69 years of age—69 years young—and have never seen the bees in such poor condition in all my life. I have the fear that not enough honey will be secured to carry them thru the coming winter.”—T. K. Massie, Mercer County, W. Va.

“The sale of honey here is just like in America. I had 11,000 pounds and sold it on the local market for 2550 crowns (\$433.50), and all was sold before Christmas. Other beekeepers who did not have more than half as much sold at a much lower price and have not all sold yet.”—Anna Sommer, Rounne, Bomholm, Denmark.

“We have had a very dry season and honey flow. Bees have wintered over fairly well and have had excessive swarming in well-kept apiaries. All this undoubtedly reduced the honey yield very considerably. My own hives are going to average close to 150 pounds of extracted honey per colony, but I have not allowed them to swarm.”—J. R. Helper, Strafford County, N. H.

“A few are extracting honey that really ought to be left for winter stores. The unusual late May rains came too late to get the benefit of the sages. The most of the honey coming in is from wild flowers revived from the May rains. A part of my bees have stores for winter, the balance I shall move to the beans. The beans are my only source for surplus, as the honey gathered at the Piru Range I will keep for winter stores.”—M. H. Mendleson, Ventura County, Calif.

“The honey production in Tennessee this year is very unusual. Around Knoxville we had an unusually good honey year. The fruit bloom was cut off some by cold weather, but the clover has been unusually good with climatic conditions right to hold it over a long blooming period. In middle Tennessee, however, conditions are quite different. They have had an extended dry period and their bees are doing very poorly. Generally over east Tennessee the bees have done well this year.”—G. M. Bentley, Knox County, Tenn.

BEES, MEN AND THINGS

(You may find it here)

“Weather has been very dry here, the nearest a dearth this county ever knew. Recent rains have started the nectar coming in. We may make a lit-

tle better than a half crop, if the weather is favorable from now on. There is no fall flow here. Alsike clover is the main dependence.”—O. B. Griffin, Aroostock County, Maine.

“We are having the poorest season here in years.”—Geo. B. Howe, Jefferson County, N. Y.

“Weather conditions have changed some, and there is still a chance of getting a normal crop for the entire season. White clover is coming in bloom again and conditions look favorable.”—O. J. Spohn, Westchester County, N. Y.

“There is no surplus so far in this locality, and unless we have abundant rain and a fall run, we will not have enough winter stores. Everything is suffering from drought.”—Gus Dittmer, Eau Claire County, Wis.

“The first flow of honey, which usually starts about the fifteenth of June, has absolutely failed this year due to unusual early rains and early June frost. Bees are getting just enough to rear brood. Crop will undoubtedly be about 50% of normal.”—T. V. Damon, Lyon County, Nev.

“The indications at this time (June 22) seem to point to a very heavy yield of honey for this section of Beedom. A ready sale for all the honey that can be secured is assured here.”—E. I. Smith, Warren County, Ky.

“My six colonies this year produced 765 pounds of white clover honey. My best colony gave 192 sections. This is my first real good crop, and it is due partly to the abundant clover, but largely to Mr. Demuth’s recent articles. They were just what I needed.”—Lide Martin, Brown County, O.

“My family and friends prefer honey on grapefruit instead of sugar. There is no particular rule about it, just use it to taste. Oranges cut up and put back in the half peel with a little dash of honey make a fine dessert.”—Ira J. Hashell, Essex County, Mass.

“I came across some combs I put in foundation for last year, with horizontal wiring and then four halves of Miller splints vertically on the foundation. The appearance of these combs was or is so fine that I concluded hereafter to put up all my frames with foundation in this way in preference to any diagonal or perpendicular wiring.”—Chas. Reynders, Bradford County, Pa.

THE Eastern Massachusetts Society of Beekeepers will hold its field meeting on August 6 in Dedham, Mass. Dr. E. F. Phillips of the Bureau of Entomology, Washington, D. C., is to be the principal speaker at this meeting.

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The Ohio State Beekeepers' Association will hold a summer meeting at Ashtabula on August 20.

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The summer meeting of the Michigan State Beekeepers' Association will be held at Alpena, Michigan, August 3 and 4.

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The annual meeting of the New Hampshire Beekeepers' Association is to be held at Durham at the State College on August 17. This association has about 70 members

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The beekeepers of northwestern Ohio will hold a field meet at Scott, O., in the apiaries of F. W. Summerfield on August 11. Mr. Summerfield will show his method of requeening without dequeening at this meeting.

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The Beekeeping Course is to be reinstated in the Massachusetts Agricultural College at Amherst, Mass., this course having been suspended when Dr. Burton N. Gates left that institution several years ago. Norman E. Phillips, brother of Dr. E. F. Phillips, is to have charge of this course.

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The Canadian Horticulturist and Beekeeper has been changed in form and is now "The Beekeeper." Commencing with the July number it will be a twelve-page journal issued once in two months. It is to be published in Petersboro, Ont., instead of in Toronto as formerly.

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Something like 1,500 colonies of bees were lost in the Arkansas Valley in Colorado by the floods which swept Pueblo early in June. At least one beekeeper, W. A. Dolsen, lost his life in this flood, his body having been swept down with the wreckage. Bert W. Hopper lost 500 colonies, together with all the equipment.

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The Fordney tariff bill, which was passed in the House on July 21, provides a tariff of 2½ cents per pound on honey imported into the United States from foreign countries instead of 10 cents per gallon as under the present tariff law. The bill must now go to the Senate where, it is anticipated, it will meet with long discussion, for passage in the fall.

JUST NEWS

Editors

The third annual summer meeting and camp of the Wisconsin State Beekeepers' Association will be held at Chipewa Falls August 15 to 20.

The American Honey Producers' League has submitted the following news item concerning the League activities: Prof. H. F. Wilson has completed a tentative schedule of the State meetings and will shortly publish the list for the benefit of those interested. H. L. McMurtry, Madison, Wisconsin, chairman of the committee to co-operate with the National Horticultural Society in their national tree-planting campaign, asks that all interested send him the names of the trees which are nectar-bearing and also good shade trees which will grow in their vicinity. Dr. E. F. Phillips, Chairman of the Research Committee, reports that some investigations have been made on the subject of the use of honey in candy and that the results will be published soon. The first advertising of the League will appear in Good Housekeeping issue for September. It will show a sketch of a comb of honey on the breakfast table, with biscuits and milk to whet the appetite of the reader. At the same time the wholesale grocers will receive a circular, and articles will appear in newspapers throughout the country on the use of honey as a food.

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Following is a partial list of important fairs to be held this summer and fall. A further list will be published next month.

Fair.	Location.	Date	1920 Prizes.	1921 Prizes.
Calif. State,	Sacramento,	Sep. 3-11	\$144.00	\$144.00
Connecticut,	Hartford,	Sep. 5-9	489.25	499.00
Southeastern,	Atlanta,	Oct. 15-25	300.00	300.00
Ill. State,	Springfield,	Aug. 19-27	589.00	589.00
Ill.-Ind.,	Danville, Ill.,	Aug. 29-Sep. 3	24.00	24.00
Ind. State,	Indianapolis,	Sep. 5-11	169.00	159.00
Ky. State,	Louisville,	Sep. 11-17	49.00	49.00
Ia. State,	Des Moines,	Aug. 24-Sep. 2	497.00	650.00
Kansas Free,	Topeka,	Sep. 12-17	200.00	200.00
Kan. State,	Hutchinson,	Sep. 17-23	363.50	444.50
La. State,	Shreveport,	Oct. 27-Nov. 6	100.00	150.00
New England,	Worcester,	Sep. 2-6	*	193.50
Michigan State,	Detroit,	Sep. 2-11	Co-op.	Co-op.
West Mich.,	Gr. Rapids,	Sep. 19-23	595.00	589.00
Minn. State,	Hamline,	Sep. 3-10	1110.00	1233.00
Mo. Cent. Exp.,	Sedalia,	Aug. 8-13	151.00	300.00
Nebraska State,	Lincoln,	Sep. 4-9	447.00	445.00
Inter-St.,	Trenton, N.J.,	Sep. 26-30	33.00	205.00
Ohio St.,	Columbus,	Aug. 29-Sep. 3	Co-op.	Co-op.
Ok. State,	Oklahoma City,	Sep. 24-Oct. 1	280.00	280.00
Oregon State,	Salem,	Sep. 26-Oct. 1	129.00	129.00
Erie Expo.,	Erie, Pa.,	Aug. 22-27	*	51.00
S. Car. State,	Columbia,	Oct. 24-28	*	5.25
Inter-State,	Chat'ga, Tenn.,	Oct. 1-8	103.00	103.00
Tenn. State,	Nashville,	Sep. 17-24	301.00	301.00
Texas State Fair,	Dallas,	Oct. 8-23	423.00	442.00
Virginia State,	Richmond,	Oct. 3-13	66.00	61.00
Inter-St.,	Spokane, Wash.,	Sep. 5-10	250.00	295.00
Wis. State,	W. Allis,	Aug. 29-Sep. 3	1153.00	1497.00
N. Wis.,	Chippewa Falls,	Sep. 12-16	*	43.00
Van. Exh.,	Vancouver, B.C.,	Aug. 15-20	208.00	167.00
Western,	London, Ont.,	Sep. 10-17	*	170.00

* No record.

THROUGHOUT the greater portion of the United States there is usually but little, if any, honey stored in the hives during the fore part of

August. Even where there is an almost continuous honey flow from different sources throughout the summer, there is often a break in late July and early August, though there are some exceptions to this. In the clover region, white clover and alsike clover may continue to bloom this month if there have been sufficient rains, but it is only during exceptional years that it continues to yield nectar in paying quantities.

In many localities the main honey flow ceases in June or July and there is no later honey flow that is sufficient in amount to furnish surplus honey. In other localities, such as the strictly buckwheat region of New York, Pennsylvania, and West Virginia, the main honey flow does not begin until some time this month, the earlier honey flows not being sufficient in amount to be depended upon for surplus. Still other localities furnish both an early honey flow and a late honey flow, usually with a break of a few weeks between, the break in most cases being in late July and early August. On swampy land and in river bottoms there are sometimes enough fall flowers that come into bloom usually in August to make it necessary to give the bees more room in which to store the honey. During occasional wet seasons there may be enough fall flowers, such as heartsease and aster, even on the uplands to furnish surplus honey.

In Canada the yield from fireweed is frequently at its best during this month, and in the irrigated portions of the Northwest alfalfa and sweet clover usually continue to yield during August. But for most locations within the United States August brings either a dearth or a scarcity of nectar, especially during a hot and dry summer, and the beekeeper must make his plans accordingly.

Comb-Honey Supers Removed During Dearth.

Too often the comb-honey supers that are not filled with honey during the early honey flow are left on the hives all summer, with the hope that the bees will fill them later. If any are on the hives at this time, they should be taken off at once unless the bees are still storing honey in them, for if they are left on the hives during a dearth of nectar in August for even a week the sections and foundation will be badly damaged by the bees gnawing the foundation and varnishing over both the foundation and the sections with propolis. In some localities so much propolis is gathered that both sections and foundation are ruined in this

TALKS TO BEGINNERS

Geo. S. Demuth

way. Since most beekeepers who have but a few colonies are producers of comb honey, thousands and thousands of sections and sheets of foundation

are ruined in this way every year.

But the loss does not stop here. In many cases these sections are put back on the hives the next season, and since the gnawed and propolized foundation is not acceptable to the bees, the colony may loaf or swarm rather than build combs in them, thus resulting in the loss of the crop. Even if such propolized sections are finally filled the next season, the honey can not be sold as first grade on account of the badly stained sections.

If these supers do not contain any honey, it is not necessary that they be emptied of bees before they are taken off; but they may be removed, bees and all, and by standing the supers on end, leaning them against the side of the hive, the bees will leave them within an hour or two. This should not be done if any of the sections contain even a small amount of honey, for to do so would be almost sure to start the bees robbing. Supers which contain some honey should be taken off by means of the bee-escape, or the bees should be driven out by smoke.

Even in those locations where there is a fall flow, usually beginning some time this month, it is not best to leave the sections on the hives during the interval between the early honey flow and the fall honey flow. They should be taken off and stored in a warm dry room or attic until the fall flow begins when they may be put back on the hives if needed. If no fall flow is expected the unfinished sections which contain some honey can be sorted into different grades. Those which contain less than a half pound of honey can be saved to feed the bees later; and those which contain a half pound or more can be used at home or sold as culls. All comb-honey supers should be carefully piled so that mice can not get into them.

Extracting Early Gathered Honey Before the Fall Flow.

If extracted honey is being produced it should be extracted before any of the fall flowers begin to bloom, to prevent the mixing of the fall honey, which is usually amber or dark in color, with the earlier gathered honey which in most northern locations is a lighter-colored honey. Sometimes the early honey is not fully ripened before the beginning of the fall honey flow, in which case it may be necessary to leave the combs which are not sealed, extracting only from combs which are mostly sealed, the unripe honey thus being left to be mixed with the fall honey.

The process of extracting or the handling of the sections of comb honey should be done in a room which is well screened, having no openings thru which robber bees can enter. After the honey is extracted the empty combs should be put back into the supers and set back on the hives so the bees can clean up the combs and protect them from moths. While the bees will usually store some honey back in the combs when this is done, it is a method which a beginner can safely use. The combs should be given to the bees in the evening after they have quit flying for the day.

Preparation for a Dearth of Nectar.

The beginner should begin now to look forward to having the colonies in the best possible condition for winter. Much depends upon what happens within the hive from the middle of August until the first of October and the fate of the colony during the winter is determined largely before winter begins. To have good colonies for winter it is not necessary that they be booming strong now, provided they have the means of building up to normal strength for winter. The workers that make up the colony the first of August are not the ones that will make up the winter colony. The present workers will all be dead before winter begins, and the winter bees are yet to be reared. In fact, a good two-frame nucleus can be built up to a normal colony for winter even after the middle of August, if it has a good queen and plenty of food for rearing brood. On the other hand, colonies that are now so strong that there is not room for all the bees within the hive after the supers have been taken off, may be so reduced by the first of October that they are worthless if a normal amount of brood-rearing is not carried on in the meantime. The two things which most frequently prevent normal brood-rearing during August and September are a dearth or scarcity of nectar, together with too little honey left in the hives at the close of the season, and a poor queen or queenlessness.

The beginner who produces extracted honey will be tempted to extract all of the honey from the supers, expecting the bees to have enough in the brood-chamber for their fall and winter needs. Too often if there is no fall flow, the amount that is left in the brood-chamber now is not enough even for the needs of the colonies during the remainder of the summer and the fall, to say nothing of their winter stores. Even when comb honey is produced the bees sometimes put so much of their honey into the supers that there is not enough left in the brood-chamber to last until winter, unless they are able to gather considerable nectar during the fall, the comb-honey colonies usually have much more honey in the brood-chamber at the close of the honey flow than extracted-honey colonies.

The only safe thing for the beginner to do, unless he is located where the fall honey

flow is quite certain, is to leave with the bees enough honey at the close of the early honey flow to supply their needs thru a possible dearth of nectar from now on. When producing extracted honey at least five full frames of honey should be left in the upper story in addition to that in the brood-chamber. When producing comb honey this is usually not necessary, but it is well to have two or three extra combs of honey for each colony, to be given later if needed. Some comb-honey producers arrange to have certain colonies store these extra combs of honey in an upper story during the early honey flow.

In addition to an abundance of stores, each colony should have a good queen at least after the middle of August, for a poor queen or an old queen can not be expected to lay enough eggs during the fall to produce a good colony for winter when nectar is scarce, even when plenty of honey is left in the hives. If colonies are requeened to improve the stock or to supplant old and failing queens, this should be done in time for the young queen to begin to lay soon after the middle of the month, in order that there shall be time to rear plenty of young bees for winter.

To find and kill the old queen in order to introduce a young queen at this season is a rather difficult undertaking for a beginner, especially if there is a dearth of nectar and the bees are blacks or hybrids. Under such conditions it may be best either to ask a neighboring beekeeper who has had more experience to help find the old queen, or to wait until later in the month when there may be more nectar available. Great care should be taken in all requeening operations to prevent robbing, for if robbing is started the new queen is more liable to be lost in introducing. The printed directions for introducing sent out by the queen-breeder should be strictly followed when introducing queens.

Preparation for a Fall Honey Flow.

Where a fall honey flow is reasonably certain it is not necessary to leave so much honey in the hives at the close of the early honey flow. For extracted honey, the extracting combs having been put back on the hives after being emptied, the colonies are ready at any time for a fall honey flow, but for comb-honey the supers should not be put back on the hives until the fall flow actually begins in earnest and the bees begin to elongate the cells in the upper portion of the brood-combs as at the beginning of the early honey flow. Unless the fall honey flow is rapid it will be better not to put on comb-honey supers. It would be much better, in such cases, to give an upper story of empty combs and let the bees fill these; then, if not too far north where the winters are severe, leave the extra story of honey on the hive all winter, and note how rapidly colonies so abundantly supplied with stores will build up next spring.

FORTY-SIX years ago, shortly after I announced in public my stand for the Lord Jesus Christ first and for A. I. Root second, I started in this journal a department headed *Our Homes*. When I undertook to carry it out I did not know but I should be called upon to give up bee culture and

and the new bee journal; but when I prayed over it the answer seemed to be to go ahead with bees and the journal, but to set aside a department for the special work whereunto I should be called and *guided and directed*. As I looked over humanity it seemed to me then that making the *homes* more pure and sacred was what the great wide world most needed; and I still think so as I look back, over the years, and consider poor sinful humanity. Intemperance then seemed to be the great arch enemy of the home; and you know how I have fought it all of these 46 years, and how my prayers are just now being answered. Praise the Lord for recent victories. Well, what comes next to intemperance, as a weapon for the arch enemy of all that is good and pure? Let me digress a little.

For many years we have heard about "boy preachers," and I think I have heard some recent mention of a boy preacher who was, or is now, doing a great work. Perhaps people will listen to him because he is a boy, and this may be one reason why I listened and laughed (may God forgive me) because somebody told me that a boy passing my place of business was a "preacher." I went to hear him largely *because* he was a boy; and that boy (bless his memory) was, thru God's providence, the means of my making the greatest discovery of my life—the discovery that I was a *sinner*, and enabling me to get in touch with "the Lamb of God that taketh away the sin of the world."



The girl preacher.

OUR HOMES

A. I. ROOT

Ye have heard that it was said by them of old time, Thou shalt not commit adultery.—MATT. 5:27.

But I say unto you that whosoever looketh on a woman to lust after her hath committed adultery with her already in his heart.—MATT. 5:28.

And if thy right eye offend thee, pluck it out and cast it from thee; for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast into hell.—MATT. 5:29.

that she really is a *preacher*, I leave it with you to decide when you have heard her sermon. By the way, I am not really sure at this moment that she is a follower of the Lord Jesus Christ; but even if she is not, I feel that God has called her to take up a most important work; and I do not know but I should say it is *the* most important since prohibition has been accomplished and the law is being enforced. I found her picture and her sermon in the Cleveland Plain Dealer some weeks ago. The article was copyrighted by the McClure Newspaper Syndicate, and they have furnished me the two pictures. Below is the sermon, or what I have been glad to call a sermon, by the girl preacher:

THROUGH EYES OF A WOMAN.

By Jane Doe.

THE MARRIED MAN AND YOU.

He may be your chief; he may be your best friend's husband; he may be the man who gives you your singing or French lessons; he may be the man you meet on the "L" every day and who is so attentive and good looking. It really doesn't matter who he is if he has a wife.

Steer clear of him.

Many and many a girl is frittering away her opportunities and perhaps her best years on a love affair with a man who has only about one chance in a hundred to marry her, and even if that chance came would probably fight shy and seek other pastures new.

The married man who philanders is not the sort of pal for any girl.

If he has so little loyalty to his wife, if he can forget his obligations so lightly and fluff with any girl who gives him half the chance, you can make up your mind to the fact that there will be no respect left at all for her who so willingly philanders with him.



As she gives her sermon, "The Married Man and You."

With the above

If you are on sentimental relations with a married man, you are asking for trouble, and you will get at that is coming to you—without fail.

Moreover, you are not only harming your own self, your own freshness, your own reputation, all of which should be so precious to you, but you may bring lifelong misery into the other woman's heart.

It is a great thing for any girl to be able to look back on her life and say: "I never poached on any other woman's preserves, and I never had a love-affair with any one I couldn't take home to mother and father."

Besides, there will come a time, dear girl, when you will fall in love—sanely, cleanly, and really and truly.

And there will also come a time when you will want to tell your lover everything; you will want to dig up all that part of your life which passed before you knew him.

And the part about the married man whom you will then regard with contempt and loathing will be the hardest and most miserable to tell, and you'll feel you'd give anything on earth to have had that episode erased from your life's slate.

There is something about an affair with a married man which is unspeakably degrading and cheapening. You will never feel the same girl after it.

When a man tries to play on your sympathies by telling you about his cold-blooded, unsympathetic and non-understanding wife, and that only your sweet little heart was destined to beat in unison with his, hit out straight from the shoulder and tell him he has proved himself worthless of either love or understanding.

Married men sometimes get tired of their wives. But don't let them console themselves with you.

JANE DOE.

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If you think I am exaggerating the importance of the above, let me call your attention to the number of divorces reported in every daily paper. Heretofore many divorces have come about because of strong drink; and we hope and pray that we may now find the number of homes broken up in this way greatly lessened. It would fill this journal if I were to tell you even briefly of the homes I have known to be broken up; and many times the whole trouble started by some trifling piece of folly.

Just shortly after I saw the above in the Plain Dealer there was an account of a murder. A young girl on the witness stand admitted that the defendant did "playfully hug" her once; and in trying to make it appear that there was nothing particularly *wrong* about it she said they were just "cutting up;" and this cutting up as it is called resulted in jealousy and murder. We are told that Satan goes about as a roaring lion seeking whom he may devour, and also that he goes about as an angel of light. The great wide world does not seem to know, that Satan traps a man in this way exactly as he traps him with strong drinks, cigarettes, or things of that sort, until the poor wretch actually thinks he can never be happy nor even *live* unless he can have some other woman or girl than the good wife who legally and before God belongs to him. I shall have to confess that I never noticed until I started this Home paper that what the dear Savior said about plucking out an eye follows *right after* what he says about adultery. And, my good friend, if you are a married man you had *far better* lose an

eye or your right hand, than to get into Satan's toils in this way.

I think I once advised in these Home papers that every man, when he is of the right age, should be married—that is, unless there is some serious obstacle in the way; and in the same way every woman of the proper age should be a married woman, and, if God permits, become a mother—a lawful mother before God and man. Here is a statement which I found this morning in the same Plain Dealer I am quoting from:

This statement was made today by William B. Joyce, president of the National Surety Co., whose business it is to insure men's honesty:

"Married men, because of the responsibility of their families, are more honest than bachelors in the ratio of about 6 to 1."

I never thought of that before; but since it has been brought to my mind, I believe that, even if the above *is* somewhat of an exaggeration, there is a lot of truth in it. When I get acquainted with a beekeeper or a scientist or any one else who has done a good work for humanity I want to know right away whether he is a married man, and, next, I want to know, if not too impertinent, if he stands before the world a professing Christian. Our girl preacher intimates that there may be one chance in a hundred for a silly girl, trifling with some married man, to succeed in making him her husband. The only way in which such a thing can happen legally would be as the result of the death (or divorce) of his wife. The Savior says in one of his texts, that "whosoever looketh on a woman to lust after her hath committed adultery with her already in his heart," altho he may not be exactly a criminal. But, my good friends, just consider seriously of even looking forward to the possibility that your neighbor's wife may die; and, again, think of a married man who may even let the possibility of his wife's death come into his mind in order that he may legally marry the silly girl who permits his advances. Would not that be almost akin to committing *murder* in your own heart? Let me give you a brief sketch.

A certain doctor was getting to be pretty well acquainted with a widow's daughter. When he went out to visit a patient he sometimes took this daughter along. His own wife was a most beautiful Christian woman; but in spite of all the doctor's skill she sickened and died. (May it not have been of a broken heart?) In due time this doctor married the widow's daughter; and altho it was not very long after the death of his wife, he could not, or at least he did not, conceal the exuberance of his joy that he could *now* have this beautiful girl for his legal wife. Did they "live together happily ever after," as the story-books have it? Not much. They were soon quarreling. They were not at all suited to each other.

In the same neighborhood was a railroad

man. His duties were such that he could not get around home to meet his charming young wife oftener than once in two or three weeks. In the course of time this railroader's wife had to call a physician. When she was convalescent, in order to give her "fresh air," etc., the doctor took *her* out in his buggy. People began to talk. The railroad man came home, and he and the doctor accidentally met each other on the street; and finally the neighbors, when they saw the two had become excited, saw also two revolvers produced; and had it not been for their interference a tragedy would probably have ensued. Two divorces followed, and *once more* the doctor had a new occupant in his home. There was such talk, however, about it, that the doctor evidently considered it best to mend his ways. I do not know whether he became a follower of the Lord Jesus Christ, or not, before he died.

Just one more incident:

In a certain town in Ohio there was a wealthy manufacturer, but he openly professed skepticism and infidelity, both in public and in print. He would stop his business at almost any time to criticize God's holy word. During one of the church revivals his case was mentioned, and a committee was appointed, not only to pray for him but to labor with him in regard to the harm he was doing the community by his example. Among the committee was a Christian woman who seemed to have remarkable skill in winning souls to Christ. She was appointed to go and call on this skeptic and see if she could not do him some good. Now, as soon as I knew of it I said the church was very unwise. This skeptic was well read. In many respects he was a man of great ability. Instead of this good woman winning him over to *her* religion he won her over to *his* hopeless infidelity and unbelief. Altho he was an elderly man with a good-sized family of eminently respectable men and women, two divorces followed and the two were married.

Years ago I protested about having a business man and his stenographer shut up together in a little room by themselves; and you have only to go over the daily papers to see how many divorces come about now, because of somebody's "stenographer." A certain banker was doing quite a business. He became so much infatuated with his stenographer that there was talk that it threatened to break up his home. A minister was called in, and I was consulted in regard to the matter. When I declared that the stenographer should leave in an instant, even if the banker's wife *was* unreasonable, the minister replied something like this:

"Mr. Root, that stenographer is the life of the bank. She has had more to do in building it up and enlarging the business than the banker himself. It might be the ruin of the institution if she were sent away."

What do you think I said? Something like this:

"Then let the institution go to ruin. In a case like this, dollars and cents should not count. If this woman's presence in the bank was of more consequence than the happiness of the wife and mother, let the banker go somewhere else or do something else, no matter what happens to finances."

My advice was not taken, and pretty soon there was a divorce, and the banker married the stenographer, and I think the banking business went "down" and out," shortly after. "What God hath joined together, let not man put asunder," says the Savior.

I wish to call attention to the girl preacher's statement, "There will also come a time when you will want to tell your lover everything." And I might go on and quote from the whole sermon in the same way. May God bless that bright message; and may it be read again and again and *considered*, by both, "the married man and you."

Please do not think from what I have said or from what the girl preacher has said about the "married man and you" that a married man or a girl should not be pleasant, courteous, and sociable; but both should be careful, and avoid the temptation to *discriminate*. The married man should treat all girls alike so far as circumstances will permit. There should be no special favorites. In the same way the young woman should be pleasant and agreeable to all married men alike. Let each keep constantly in mind that beautiful text written by one who fell so suddenly (and disastrously) by departing from the right road in regard to the things I have pointed out—David.

Search me, O God, and know my heart; try me, and know my thoughts; and see if there be any wicked way in me, and lead me in the way everlasting.—PSALM 139:23, 24.

"The dearest idol I have known,
Whate'er that idol be,
Help me to tear it from its throne,
And worship only thee."

Blueberries and Huckleberries Under Cultivation.

I have always, since early childhood, been interested in huckleberries—both the kind that grows in the swamps and the other sort that grows on high ground. I believe the latter used to be called "blueberries." At various times during the past 50 years I have heard of attempts to grow one or both in the garden under cultivation, but I believe they have always been failures. Some years ago the *Rural New-Yorker* announced that a lady in New Jersey had discovered the reason of failure, which was that both huckleberries and blueberries must have an *acid* soil. They can not stand stable manure nor any soil containing lime. The paper stated further that she was achieving great success in a soil made up of rotten leaves and sand. The decaying leaves produce the sourness; and in order

to keep up this sourness more leaves must be provided, and, as a matter of course, plenty of moisture. I think the statement was also made that certain parties from the Department at Washington were helping her in her work, and collecting specimens of the largest and finest berries to be found near swamps as well as on the dry land.

Well, something like a year ago I noticed in the Florida papers mention made at different times of cultivated blueberries in Florida. A nursery located at Oldsmar, near Tampa, advertised plants producing berries over half an inch in diameter, and which grew on bushes or trees from five to ten feet high. They also made the statement that one plant had produced a bushel of berries, and another one 21 quarts of berries at one picking. I submitted the statement to the Department of Agriculture, and they gave it as their opinion that the merits of the plant had been greatly exaggerated. This same nursery advertised half a dozen or more varieties. During the past winter I paid the nursery two visits. I saw plants in bloom so tall that I had to bend the tree down so I could get the perfume of the blossoms, and I carried home seven plants of different varieties, for which I paid \$4.50. At the present writing, July 14, I am informed that only two plants of one variety are living. This is probably owing largely to neglect since I left May first, and also to a severe drouth during May and a part of June.

In June I had some correspondence with Miss Elizabeth White of New Jersey, the lady who first demonstrated that blueberries can be grown successfully under cultivation; and finally it was my pleasure to visit her plantation on July 7. As her location, Whitesbog, New Jersey, is not very far from where W. A. Selser of Philadelphia lives, he accompanied me. As his hearing is better than mine I submit below some notes that he took down.

We reached Mount Holly at 9:05 a. m., where Harold Horner met us in his automobile, and took us to his house, about a mile and a half from the station. After resting a few moments, Mr. Horner drove us all around his sixty-acre fruit farm. He is the only fruit-grower in that part of New Jersey who has any fruit whatever. He has one of the best crops of apples and in all some 50 odd varieties.

Mr. Horner has about 90 colonies of bees on the lawn at his home and expects about 6,000 pounds of honey this year. Some of the hives are tiered up four and five stories high. He had all new queens introduced this spring, which is his custom, and he claims that he is the exception in getting an apple crop *because* of the quick fertilization of the apple blossoms by the bees.

There is one orchardman in his State, who is planning to pay him \$500 next year to have him place 100 colonies of bees in his orchard. This will be simply a rental, and Mr. Horner will have the bees returned to his own place after the three weeks' blossom time is over. This shows the value of bees to agriculture.

Mr. Root had a nap for about an hour, after which Mr. Horner drove us for a trip about 16 miles to Joseph J. White, Inc., blueberry and cranberry plantation. Miss White is treasurer of the company. She, however, was unexpectedly called away, greatly to her regret, to attend a board meeting of

the New Jersey State Institution for Feeble Minded, of which she is secretary. She delegated S. B. Hutton, who is her right-hand man (his address is Brown's Mills, N. J.), to explain everything in detail to Mr. Root and take him over the whole plantation.

They have in all about 25 acres in blueberries, and a number of Italian pickers already in one of the fields. There are 15 acres in which the Federal Government is co-operating with Miss White along experimental lines to get the best results.

A number of the bushes were enclosed with a contrivance consisting of an iron frame with white mosquito netting covering it. The bottom circular frame to which the mosquito netting was fastened, could be raised and the bushes easily examined. We were simply amazed at the largeness of the berries, and by actual measurement some of the berries were as big around as an ordinary copper cent. The clusters were nearly as large as a small fist and looked like immense clusters of grapes. Mr. Root's amazement knew no bounds.

The soil two feet below the surface was wet and water could be obtained by digging 24 inches, but the surface was well cultivated and very fine, dry sand.

They were sending their berries mostly to hotels in New York, also the seashore, and were getting 50 cents per quart wholesale for them, but could sell more than they could produce.

Mr. Hutton went into detail with Mr. Root in reference to the proposition. Some have been grown from seed, others from cuttings and plants. The bushes do grow as high as six feet or more, but Mr. Hutton claims these must be put back and never allowed to grow so high as the fruit is not so good.

July 7, 1921.

W. A. Selser.

Sure enough, there were the blueberries I had heard so much about. I think there were about ten acres in bearing. The whole plantation was kept in beautiful trim. Not a weed of any sort was visible. You will see by measuring that a copper penny is just $\frac{3}{4}$ of an inch across, so the largest of these berries were equal to a fair-sized cherry. The birds were somewhat troublesome; and in order to give me a view of some of the best where no fruit had been gathered, a circular tent of mosquito netting was put over them. A hoop at the bottom could be raised to permit of picking, but no bird could enter it. The rows were eight feet apart, and the berry bushes were every four feet in a row.

The Department of Agriculture has succeeded in getting several improved varieties. Some of them came from seeds planted, and others by dividing the roots of desirable plants. It takes about three years to get fruit from a seedling. As it is with apples and many other fruits, the most of the seedlings are of no account. And then there is another serious trouble. You can not get blueberry cuttings to start in sand (or in a bottle) in the way the florist multiplies varieties. The expert mentioned said I could multiply my plants by taking a big thrifty plant and dividing it up or cutting it up, of course leaving a little root on each stalk. When I first found out about Miss White's work I wanted some plants; but I was told the supply was exhausted for the season. I was so urgent, however, that they shipped me two of their best varieties, carefully packed, at a cost of \$5.00 each. Both are now growing finely. On July 12 one of these plants sent out a vigorous shoot that

is now making a growth of something like $1\frac{1}{2}$ inches a day. So the huckleberry, where it has things to suit it, is certainly a wild grower. Now as to the quality.

At Mr. Hornor's, who is a nurseryman (or has been), they gave me a dish of beautiful peaches with sugar and cream; also another dish of red raspberries with sugar and cream; and a third one of the new



The new blueberry produced by the Department of Agriculture by crossing some of the best wild varieties. We are obliged to reduce the photograph on account of a lack of room; but some of the best berries shown in the picture were really the size of good-sized cherries.

huckleberries. When I tasted the peaches it occurred to me it would be a rather hard matter to get *any* fruit even its equal, and I said the same thing of the red raspberries. Then I tasted the huckleberries, and these *were* certainly ahead. I believe Miss White's cultivated blueberries are equal if not superior to any other fruit I ever tasted. The plant has no insect enemies; and I was greatly relieved when the expert informed me there should be no pruning—let every branch or sucker grow that will grow. As I looked around on that bright morning, especially at the fruit, I said to my attendant that I could almost say with the queen of Sheba, "Behold, the half was not told me."

Now, there is no trouble about growing this beautiful fruit anywhere by providing rotten leaves or even rotten sawdust or peat from the swamp, with a certain admixture of sand (perhaps about $\frac{1}{2}$); but be sure not to get in any lime, and keep packing leaves into the soil so as to preserve the sourness. The plants will probably be high in price for a long while because of the difficulty I have mentioned in propagation.

I am told it is really true that they are growing blueberries and huckleberries in the eastern part of Florida by the acre; and

we have just had a sample of the berries. So far, however, they are smaller in size, and much like the swamp huckleberries on the market. We have the promise of some larger ones later.

There is a small inferior wild huckleberry growing on my own ground at Bradentown, Fla, and I am told they are growing almost all over Florida. We visited one plantation at Dunedin, Fla., where there are about 400 plants growing and in bloom. The plantation was so full of weeds, however, at the time of our visit that it did not show to very good advantage.

Below is a clipping just at hand:

Picking is in full swing on the Sapp Blueberry Farm in Okaloosa County, a large force of women and children being given employment at remunerative wages, and the berries are meeting with a ready sale at 15 cents per quart. From one bush so far this year Mr. Sapp has picked over thirty quarts and there are fully two-thirds as many more yet to ripen.—DeFuniak (Fla.) Breeze.

And here is something from Miss White herself:

Dear Mr. Root:

I am so sorry I was unable to personally show you the blueberries the other day, tho surely Mr. Hutton was a good guide.

He tells me you desire illustrations for an article in your magazine, and I take pleasure in supplying them.

The cluster illustrates Katherine, a hybrid produced by Dr. Frederick V. Coville of the U. S. Department of Agriculture, by crossing two wild bushes. The other picture illustrates a choice bush on which the berries are being measured with a blueberry gauge, and otherwise studied. For some time previously it has been protected from birds, etc., by a screen of netting, which has been set back to facilitate the examination.

With kindest regards, I am,

Sincerely yours,

Elizabeth C. White.

New Lisbon, N. J., July 11, 1921.



Our good friend Miss Elizabeth White, who started the work of improved huckleberries. Her broad-brimmed hat does not give us much of a glimpse of her face; and, altho I was considerably disappointed at not meeting her face to face, it rejoiced my heart to know that she was interested in the feeble-minded of her region as well as in giving the world this wonderful new and luscious fruit. "Ye are of more value than many sparrows."

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Bert Smith, J. J. Lewis, Heard & Woodhull, W. A. Hunter, E. A. Harris, R. F. Holtermann, J. B. Marshall & Son, P. W. Stowell, H. S. Ostrander, C. M. Elfer, Wm. C. Smith, Otto J. Spahn, Curd Walker, Van Wyngarden Bros., E. F. Quigley & Son, F. M. Russell, H. N. Major, Jensen's Apiaries, Herman McConnell, Paton & Cowell, Oscar Mayeux.

HONEY AND WAX FOR SALE.

FOR SALE—Fancy clover honey in 60-lb. cans. Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Fine quality raspberry milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—8000 lbs. choice white clover extracted honey. State quantity wanted. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c. same to apply on first order. David Running, Filion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State Honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—New crop fancy white comb honey. No. 1 grade, \$7.00 per case of 24 sections; No. 2 grade, \$6.00. Extracted clover honey, 15c per pound; amber and buckwheat, 12½c per pound; two 60-lb. cans to case. Amber in 50-gal. barrels, 10c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Choice clover extracted honey. State quantity wanted. New crop will be ready about August 10. J. D. Beals, Oto, Iowa.

FOR SALE—Our crop of 60,000 lbs. finest quality comb and extracted honey. Also 4000 lbs. of last year's extracted honey at reduced prices. Gelsner Bros., Dalton, N. Y.

FOR SALE—Finest basswood and white clover honey in 60-lb. cans. In single cases, \$9.25; in double, \$18.00, f. o. b. Weston. Sample 20c. A. S. Tedman, Weston, Mich.

FOR SALE—Finest white clover extracted honey. One 60-lb. can, \$9.60; two 60-lb. cans, \$18.00, f. o. b. Holgate, Ohio. 5-lb. pail, \$1.25; 10-lb. pail, \$2.25; delivered to 4th postal zone. Noah Bordner, Holgate, Ohio.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white sweet clover, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans, in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. The crop will be ready for the market some time this month, August. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEE SWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

BEE SWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—To get in touch with a beekeeper who has got well-ripened white clover extracted honey for sale. State lowest price per ton. Gust Hubert, Loleta, Calif.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slungum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healey, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—A Cowan rapid reversible extractor, used only once. Price, \$20.00. J. Doe, Harvard, Mass.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

POWER rip and cross-cut saw, \$30; Sun type-writer, \$10; lathe, \$3.00; 3x5 printing press, type, etc., \$8.00. Clarence Foote, Delanson, N. Y.

SHIPPING CASES. 25c per case, $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$ -inch. Sliding cover, 3-inch glass K. D. Sold only in original packages of 50 at \$12.50 per package. Only 1000 cases. The A. I. Root Co., Medina, Ohio.

FOR SALE—One 4-frame automatic hand-power extractor, price, \$45.00; one 2-frame with 12-inch pockets. Cowan rapid reversible, \$25.00, as good as new. Jos. H. Hoehn, Ottoville, Ohio.

FOR SALE—Combined clover huller and scarifier, two screens and one extra set of linings, \$3.50. Postage extra. S. Rouse, Ludlow, R. D. No. 2, Ky.

FOR SALE—Single-tier comb shipping cases and carriers, K. D. all sizes, at bargain prices. Also covers, bottoms, supers, etc. Write for my new bargain list and be convinced. C. C. Brinton, Bloomsburg, Pa.

FOR SALE—50 Standard, two-story, ten-frame, metal-covered hives, nailed, painted, with Hoffman frames, wired, with full sheets of foundation. In lots of five or more, \$5.00 each, f. o. b. Mobile, Alabama. H. A. Goering, Crichton, Ala.

FOR SALE—One 4-horse power gasoline engine. Just the thing to run an extractor. Have used same for this purpose for two seasons. Price, \$60, f. o. b. Syracuse, N. Y. Chas. G. Schamu, University Block, Syracuse, N. Y.

HONEY CONTAINERS—100 cases round jars, 16 oz., put up 2 doz. in case; per 10 cases, \$16.50; per 25 cases, \$40.00. 400 cases containing two 5-gallon cans, second-hand; per 10 cases, \$7.00; per 25 cases, \$15.00; per 100 cases, \$50.00. The A. I. Root Co., 230 W. Huron St., Chicago, Ills.

WANTS AND EXCHANGES.

WANTED—Extractor, state size, condition, and price. Walter P. Brown, Carthage, R. D. No. 4, Mo.

WANTED—Second-hand Cowan honey extractor. Carl Erikson, Nora Springs, Iowa.

WANTED—At once, a two-pocket reversible extractor with brake. State price. Van Collins, Port Chester, R. D. No. 1, N. Y.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—Root capping melter, separating can, one-burner oil stove. Leon D. Thayer, Cummington, Mass.

FOR SALE OR TRADE—For power extracting equipment or anything you have, old and new eight and ten-frame hives, two foundation mills, Hatch wax press, Root two-frame extractor, 60 lbs. foundation, and other supplies. Hickory Shade Apiary, Otterville, Mo.

REAL ESTATE

FOR SALE—40-acre farm $\frac{1}{4}$ mile from town, 10-room house, frame barn, windmill, telephone, orchard, 20 swarms of bees in eight and nine frame Hilton hives, extractor and hives and other supplies to operate 100 swarms, honey-house. Mrs. Fred Snyder, Bentley, Mich.

NOTICE—We have a productive territory for beekeeping and the property advertised by me in July issue of Gleanings will pay—the farm 25 to 50%, the bees 50 to 100% annually, plus cost of operating. This is a conservative estimate. B. F. Averill, Howardsville, Va.

FOR SALE—Big bargain! Selling out, leaving the State. I will sell my fine apiary of 100 colonies of Italian bees in 8 and 10 frame new hives, and all up-to-date equipment for running same, on a buckwheat location, 30 miles west of Alexander's apiary in New York State, in village three miles from car line, includes all my honey customers, good for 4 tons of honey each season. Good will, etc., also includes house, one acre of good land, fruit, bee-cellar, honey house, etc. All for \$1700 cash. Get busy and write me. Walter J. D'Allard, Amsterdam, R. D. No. 5, N. Y.

MISCELLANEOUS

HUBAM, or White Annual Sweet Clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as \$10,000 per acre for each crop. It takes several years to mature but will average \$1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; \$1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

BEEES AND QUEENS.

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, \$1.00 each.
W. G. Lauver, Middletown, Pa.

THAGARD ITALIAN QUEENS—See display advertisement elsewhere.

SIMMONS' ITALIAN QUEENS bees and nuclei. Fairmount Apiary, Livingston, N. Y.

SEE our large advertisement on page 522 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's **GOLDEN**, it's **PHELPS**. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—100 colonies bees in lots to suit buyer. R. S. Becktell, Rifle, Colo.

GOLDEN Italian queens, untested, 1, \$1.25; 6, \$7.00. E. A. Simmons, Greenville, Ala.

MY famous Italian queens, June 1 and later, \$1.50 each, six for \$8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

IF you want queens that will produce results, give **THAGARD'S ITALIAN QUEENS** a trial. V. R. Thagard, Greenville, Ala.

QUEENS—Three-banded Italians, untested \$1.25 each; \$12.00 for 12. Satisfaction guaranteed. J. D. Kroha, 87 North St., Danbury, Conn.

FOR SALE—Golden Italian queens, untested, \$1.00; 6, \$5.00. Tested, \$2.00. J. F. Michael, Winchester, Ind.

PHELPS GOLDEN QUEENS will please you. Mated, \$2.00; 6, \$10.00; or \$18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—15 colonies pure-bred Italian bees, queens 1920, full equipment, mostly new. Emil Uylert, New Brunswick, N. J.

FOR SALE—20 colonies bees in standard L. hives, \$10.00 per hive. T. A. Kragness, 6031 Wentworth Ave., Chicago, Ills.

FOR SALE—Untested Italian queens, three-banded only, \$1.50 each; 8.00 per half doz., \$15.00 per doz. J. F. Garretson, Bound Brook, N. J.

BEEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigree breeding stock. Elton Warner, Asheville, N. C.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick. V. R. Thagard, Greenville, Ala.

FOR SALE—A few choice queens shipped in frame brood, \$4.00 each. Jes Dalton, Bordeloville, La.

THE A. J. ROOT CO. pure leather-colored queens, untested, 1, \$1.25; 6, \$7.00. Greenville Bee Co., Greenville, Ala.

FOR SALE—Bright Italian queens, \$1.50 each; \$14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—Golden queens ready May 1: 1, \$1.50; 6, \$7.50; 12, \$14.00; 100, \$100. Virgins, 75c each. W. W. Talley, Greenville, R. D. 4, Ala.

FOR SALE—50 colonies Italian bees. Price reasonable. Write for particulars. Geo. H. Rea, 206 Chestnut St., Ithaca, N. Y.

PROMPT shipment of Golden or three-banded queens. Untested only. One, \$1.25; 6, \$7.00; 12, \$13.00. Safe arrival and satisfaction. Ross B. Scott, LaGrange, Ind.

FOR SALE—Pure Italian queens reared from the best honey-producing mothers, mated to pure drones. Untested, each, \$1.25; 6, \$7.00; 12, \$13.00; tested, each, \$2.50. H. N. Boley, Hillsboro, Iowa.

PURE ITALIAN BEES—Not the cheapest, but the best we can grow, both golden and three-banded, with clean bill of health. Sure to please. Such as we use in our own yards. Untested, \$1.25; tested, \$2.00. J. B. Notestein, Bradentown, Fla.

FOR SALE—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, \$1.00; mated, \$1.50; tested, \$2.50. F. R. Davis, Standfordville, Dutchess County, N. Y.

AM now ready to mail out young queens of Dr. Miller strain leather-colored Italians, by return mail, at \$1.25 each. A few breeders for sale. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, \$1.50 each; 6 for \$8.00; tested, \$2.50 each; select tested, \$3.00. Prof. W. A. Matheny, Ohio University, Athens, O.

COLORADO QUEENS. Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

FOR SALE—Hardy Northern-bred Italian queens and bees. Each and every queen warranted satisfactory. For prices and further information, write. H. G. Quirin, Bellevue, Ohio.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, \$1.50 each, up to nine queens; 10 to 24 queens, \$1.40 each; 25 and up, \$1.25. Allen Latham, Norwichtown, Conn.

FOR SALE—Golden queens, untested, \$1.15; 6 or more, \$1.10 each; select untested, \$1.60; 6 or more, \$1.50 each; safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Leather-colored Italian queens, tested, until June 1, \$2.50; after, \$2.00; untested, \$1.25; 12, \$13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

BEEES BY THE POUND—Also **QUEENS**, Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—250 colonies Italian bees in 10-frame hives, free from disease. Also supers, combs and winter cases. Locations go with bees if wanted. Fred D. Lamkin, Poplar Ridge, N. Y.

FOR SALE—Three-banded Italian queens, untested, \$1.25; 6, \$7.50; 12, \$14.00. Tested queens, \$2.50 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

FOR SALE—Highest grade three-banded Italian queens. Untested, each, \$1.25; 6, \$6.50; 12, \$12; 50, \$47.50; 100, \$90. Virgins, 45c each. No disease and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

FOR SALE—Golden Italian queens, untested, \$1.15; 6 for \$6.50; 12 or more, \$1.00 each; tested, \$2.00 each; select tested, \$3.00 each; extra select tested, \$4.00 each. No bees for sale. D. T. Gaster, Randleman, R. D. No. 2, N. C.

IF **GOOD** bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, \$1.00 each; \$10.00 per dozen; \$75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, \$1.25; tested, \$2.25; virgins, imported mothers, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root home-bred breeders. Untested, \$1.50; tested, \$2.50; select tested, \$3.00. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss. W. S. Tatum, Prop.

MR. BEEKEEPER—Before placing your order for queens you should read the ad at top of page 464 in the July issue of Gleanings. It will mean money saved as well as a big honey crop next season. Herman McConnell, Robinson, Ills.

PHELPS' GOLDEN ITALIAN QUEENS: Virgins, \$1.00; mated, \$2.00; 6 for \$10.00, or \$18.00 per doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Unsurpassed Italian queens. Untested, 1, \$1.50; 6, \$7.50; 12, \$14.00; 50, \$55.00; 100, \$105. Tested, 1, \$2.50; 6, \$13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

HUMMER QUEENS—Untested, \$1.00 each; \$9.00 per dozen; tested, \$1.50 each; \$15.00 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old prices. Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, \$1.50 each; select untested, \$2.00; tested, \$2.50 each; select tested, \$3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

THREE-BANDED Italians only, that have been bred to a high standard of excellence. Never had disease in my apiaries. Safe arrival and satisfaction guaranteed. Untested queens, \$1.50; 12, \$15.00; tested queens, \$2.25; 12, \$25.00. Jul Buegeler, New Ulm, Texas.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-banded Italian bees, gentle and good honey-gatherers, from July 1 until Oct. 1. Untested, \$1.25 each; \$12.00 per doz.; tested, \$2.00 each; select tested, \$3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, R. F. D. No. 2, Benson, N. C.

QUEENS—A SUPERIOR STRAIN. Bred from a queen whose colony gathered 200 lbs. honey while the other colonies did very little. Queens, untested, \$2.00 each; tested, \$3.00. Doolittle strain; queens, untested, \$1.25; tested, \$2.00. 40 years' experience in queen-rearing. Chestnut Hill Apiary, Aspers, Pa.

TO MY FRIENDS, OLD AND NEW—During our buckwheat flow we rear our best queens. Hardy, prolific, disease-resistant, honey-gathering Italian stock. We have combined color and utility and each queen guaranteed to arrive safely and give satisfaction. August prices by return mail, untested, 1, \$1.25; 6, \$7.00; 12, \$13.00; 25 for \$25.00. J. B. Hollopeter, Rockton, Pa.

FOR SALE—Three-banded leather-colored bees and queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. Prompt attention given all orders. 1 untested, \$1.00; 12, \$10.00; 1 select untested, \$1.25; 12, \$13.50; 1 tested, \$1.75; 12, \$16.00; 1 select tested, 2.25; 12, \$20.00. J. M. Cutts, Montgomery, R. D. No. 1, Ala.

AS I am continuing in charge of Apiary Inspection with the State Dept. of Agriculture, I find it necessary to sell about 100 colonies of bees, all in good equipment. All colonies are headed by young queens of my own rearing. Price f. o. b. Lansing. Ten-frame colony, \$16.00; same, two-story, \$20.00. Eight-frame colony, \$14; same, two-story, \$18.00. B. F. Kindig, East Lansing, Mich.

ANYTHING is good enough until something comes along that is better. Even a good imitation gains admiration until compared with the genuine. Likewise with queens. The market is flooded with many strains. Extravagant claims run riotous. However, quality is quickly detected by the expert. Compare Victor's Italian queens with other strains, and their superiority is noted immediately. Price: 1, 1.25; 6, \$7.00; 12, \$13.50. Julius Victor, Martinsville, N. Y.

DAY-OLD QUEENS—1, 50c; 100, \$50.00; 500, \$250.00. Untested queens, \$1.00 each. High quality three-banded Italians. Mailed in safety introducing cages. Delivery and satisfaction guaranteed in U. S. and Canada. Information in circular. Order early. James McKee, Riverside, Calif.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, \$1.00 each; 6, \$6.00; 12, \$12.00; 50, \$45.00. G. H. Merrill, Pickens, S. C.

FOR SALE—Italian queens: From July 1 to October 1, untested: 1, \$1.25; 6, \$7.00; 12, \$13.50; tested, \$2.00. I have a tested breeding queen from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. Safe delivery and satisfaction guaranteed. R. B. Grout, Jamaica, Vt.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price after July 1, \$1.25 each; one dozen or more, \$1.00 each. Package bees a specialty. Send for circular. J. H. Haughey Co., Berrien Springs, Mich.

FOR requeening, use Williams heavy laying Italian queens. They produce hardy, hustling, three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, \$1.25; 6 for \$6.50; 12 or more, \$1.00 each; tested, \$2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

FOR SALE—Until further notice we are offering our bright Italian queens, untested, at \$1.00 each; \$10.00 per dozen; \$75 per 100. We guarantee safe arrival, pure mating, and reasonable satisfaction in U. S. and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated. Graydon Bros., Greenville, R. D. No. 4, Ala.

"WELL, the queen you sent me was extra high grade. I am truly pleased. She does not stop laying when the frame she is on is taken out. This is due to her being of very quiet disposition and extra prolific. I have seen the time back North when I would have paid \$25.00 cash for such a queen. Very truly, Geo. W. Fuller, Auburndale, Fla." If you are keeping bees why not keep the best? Untested, \$1.00; select untested, \$1.50; tested, \$2.00; select tested, \$2.50. Safe arrival and satisfaction guaranteed. No disease. M. F. Perry, Bradentown, Fla.

PRITCHARD QUEENS (Three-banded Italians.)—Price, untested, \$1.50 each, 6 for \$8.00; select untested, \$1.75 each, 6 for \$9.50. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare; write for prices. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired, otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

ONE HUNDRED—When my brother, W. Z. Hutchinson, was living, we used to buy queens of J. P. Moore by the hundred each year to requeen our colonies. The last few years I have raised the queens we needed, breeding from the best in over 300 colonies of this strain. I know that I have improved the strain I started with. They are gentle, hardy, and good workers. We have 100 tested queens of this strain, one year or less old, for sale. In order to close them all out this month I will sell them for \$1.50 each, or \$16.80 per doz. They are right in their prime, first class in every respect. They should do good work another year yet. Safe arrival and satisfaction guaranteed. Elmer Hutchinson & Son, Lake City, Mich.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, \$1.25; 6, \$7.00; 12, \$13.00; 25 to 99, \$1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

JENSEN'S QUEENS BY SELECTION—Bees in nuclei, and full colonies. Untested, \$1.00 each; \$9.00 per doz. Select untested, \$1.25; dozen or more, \$1.00 each. Tested, \$1.75 each. Select tested, \$3.00. Breeders, \$5.00. Nuclei, two-frame with untested queen, \$4.50; three-frame with untested queen, \$6.00; 8-frame colony, \$15.00; 10-frame, \$17.50 with tested queens, in dovetailed hives, combs drawn from full sheets. Pure mating, no disease, prompt service and satisfaction guaranteed. Jensen's Apiaries, Crawford, R. D. No. 3, Miss.

HELP WANTED.

WANTED—A manager for the Michigan Honey Producers' Exchange, Inc. Must be a practical supply man and thoroughly understand bottling and sale of honey. A good position for the right man. Applicant kindly give age, experience, and reference in first letter, and oblige. E. D. Townsend, Chairman, Northstar, Mich.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, \$1.00 each; tested, \$1.50 each. One pound bees, no queen, \$2.00. No disease.

J.W.SHERMAN, VALDOSTA, GA.

QUEENS

Quirin's Northern-bred hardy Italians now ready. Safe delivery and satisfaction guaranteed.

PRICES OF BEES AND QUEENS.

(After July 1st)

	1	6	12
Untested	....\$1.50	\$ 8.00	\$15.00
Tested	..... 2.00	10.00	18.00
2-comb Nuclei	6.00	32.00	60.00
3-comb Nuclei	8.00	45.00	85.00
8-fr. Colony	.. 12.00	70.00	
10-fr. Colony	15.00	85.00	
Breeders, fair	.....	5.00	
The very best, each	.....	10.00	

Add the price of the queen wanted with nuclei or colony. This is our 30th consecutive season at queen-rearing.

Address all orders to

H. G. QUIRIN

BELLEVUE, OHIO

HONEY! HONEY! HONEY!

Beekeepers who are supplying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

SPECIAL BLEND OF FANCY HONEY (Liquid)

60-lb. Tins, 2 per case	....14c lb.
10-lb. Tins, 6 per case	....16c lb.
5-lb. Tins, 12 per case	....17c lb.
2½-lb. Tins, 24 per case	....18c lb.

VARIOUS GRADES (Crystallized) 60-POUND TINS.

Water White Orange	.....14c lb.
Water White Sweet Clover	..12c lb.
Extra Light Amber Sage	..11c lb.
N. Y. State Buckwheat	....10c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases	.....\$1.45 case; crates of 100, \$ 6.50
5-lb. Pails (with handles), 1 dozen reshipping cases	1.35 case; crates of 100, 8.30
10-lb. Pails (with handles), ½ dozen reshipping cases	1.10 case; crates of 100, 12.75
60-lb. Tins, 2 per case	—NEW, \$1.30 case; USED, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS.

8-oz. Honey Capacity, Cylinder Style	.....\$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service	..... 1.40 per carton of 2 dozen
Quart or 3-lb. Honey Capacity, Mason Style	..... 1.00 per carton of 1 dozen

Hoffman & Hauck, Inc., Woodhaven, New York



THE OLD RELIABLE THREE-BANDED ITALIANS



Our Italians are of an exceptionally vigorous and long-lived strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. We have sold a good many queens to parties who are using them in stamping out foul brood. If you want the very best quality for the lowest price, send us your orders at once. Will guarantee safe arrival in the United States and Canada.

July to November:	1	6	12
Untested	\$1.25	\$6.50	\$12.00
Select Untested	1.50	8.00	15.00

No nuclei or pound packages of bees for sale.

W. T. PERDUE & SONS

Route 1, Fort Deposit, Ala.

QUEENS

Select Three-Banded Italians. I have one of the most modern queen-rearing apiaries in the South, and am breeding from the best Italian stock to be found. Pure mating, prompt and safe arrival guaranteed.

	1	6	12	50
Untested ..	\$1.25	\$7.00	\$13.00	\$50.00
Tested	3.00	16.00	30.00	

Write for descriptive circular and prices on queens in lots of 100 or more.

HARDIN S. FOSTER,
Dept. G, Columbia, Tenn.

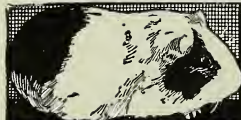
LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.



**Raise
Guinea
PIGS
FOR US!**

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge, experience or equipment needed. **Large Profits** They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squirrels—cost less to house, feed, keep, easier raised—less trouble, market guaranteed.

Particulars, contract, and booklet how to raise **FREE** **CAVIES DISTRIBUTING COMPANY** 3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company

95 Sixth St., Higginsville, Missouri.

Write for FREE catalog. It is to your interest.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, \$1.50 each; 6 for \$8.00; 12 or more, \$1.40 each; 25 or more, \$1.25 each. Tested queens, \$3.00 each; six for \$16.00.

Buckeye Bee Co., Justus, Ohio.

QUEENS

Good Queens priced right. Gentle Three-Band Italians. Untested, \$1.25; 12 or more, \$1 each. Prompt service.

D. W. HOWELL, SHELLMAN, GA.

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company

Prompt and **BECAUSE**—Only Root's Goods are sold. Efficient It is a business with us—not a side line. Service Eight mails daily. Two lines of railway.

If you have not received 1921 catalog send name at once.

Queens—Rhode Island—Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, \$1.25 each; 6 for \$6.

Queens delivered after June 1.

O. E. TULIP, Arlington, Rhode Island
56 Lawrence Street.

Three-Band and Golden QUEENS

That produce hustling bees. Bred to fill the supers. From the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Special price for summer and fall. Untested, \$1.25 each; 12 at \$1.00 each. Tested, \$2.00 each. Breeders, \$10.00. This is your time to re-queen.

DR. WHITE BEE CO.
SANDIA, TEXAS.

NOTICE!

Pritchard Queens are not just common queens named, but A NOTED STRAIN

The result of years of careful breeding and selection.
Reared and offered for sale by

ARLIE PRITCHARD

Medina, Ohio.

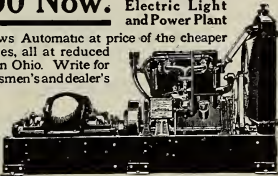
See my classified ad, page 520 for prices and guarantee.

\$295.00 Now.

A Real 32-VOLT
Electric Light
and Power Plant

See the Matthews Automatic at price of the cheaper plants. Six sizes, all at reduced prices. Made in Ohio. Write for particulars. Salesmen's and dealer's best opportunity

The Matthews
Engineering Co.
Ferry Street
Sandusky, O.



"Best" Hand Lantern



A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. Agents wanted, Big Profits. Write for Catalog. **THE BEST LIGHT CO.**
306 E. 5th St., Canton, O.

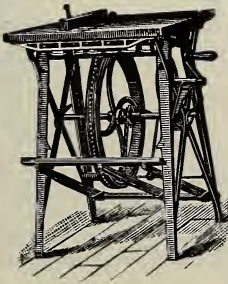
BARNES' Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO.
645 Ruby Street
ROCKFORD, ILLINOIS



NEWMAN'S Bred From the Best. Absolutely First Quality ITALIAN QUEENS

and fully guaranteed. No disease. Satisfaction and safe arrival.

Untested, \$1.25; 6, \$7.00; 12, \$13.50. Select Untested, \$1.75; 6, \$9.00

12, \$17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

Established 1885.

Write us for catalog.

BEEKEEPERS' SUPPLIES



The Kind You Want and the Kind
That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, \$1.25; 6, \$6.50; 12, \$12.50. Select untested, \$1.50; 6, \$8.00; 12, \$15.00. Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ills.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

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cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

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Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles. **THE EDWARDS MFG. CO.**
833-833 Pike St., Cincinnati, O.

**FREE
Samples &
Roofing Book**



Select Three-Banded Italians of the Highest Quality One Grade



800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

A new customer from Missouri where you have to show them, writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 lbs. surplus honey per colony, 10 lbs. more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Pure mating, safe arrival and satisfaction guaranteed.
It is left with customer to say what is satisfaction.

Prices for balance of season: 1 Untested Queen, \$1.00; for 6, \$5.50;
for 12 or more, \$10.00 per dozen. Tested Queens, \$2.00 each.

JASPER KNIGHT, HAYNEVILLE, ALA.

(Continued from page 501.)

faculties remained strong and alert to the end of his long active life. One day in his eighty-second year, he wrote a letter to a friend and two days later, in the arms of his daughter, dropped quietly off in the last sleep — "the immortal incommunicable dream."

Spicer's Three-Banded Italian Queens

now ready to mail. These queens are bred so as to have all the desired qualities, hustlers, hardy, and gentle.

	1	6	12
Untested queens	\$1.25	\$7.50	\$14.00
Tested queens	2.50	15.00	28.00

I do not list select queens, as the above are all select. Safe arrival and satisfaction guaranteed.

ROBERT B. SPICER
Wharton, N. J.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

GOLDEN OR THREE-BAND QUEENS.

Untested, balance of season, \$1.00 each; doz. \$10.00, or \$80.00 per hundred. Virgins, 50c each, or \$40.00 per hundred. All orders filled promptly or parties notified when to expect shipment; satisfaction.

R. O. COX, Rt. 4, Luverne, Ala.

PATENTS Practice in Patent Office and Court.
Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.

"QUEENS OF QUALITY"

3-band Italians only.

Untested, \$1.25 each; six
for \$7.00; \$12.00 per dozen.

We are now shipping by
return mail.

J. I. BANKS
Dowelltown, Tenn.

QUEENS OF MOORE'S STRAIN

OF ITALIANS
PRODUCE WORKERS

*That fill the super quick
With honey nice and thick.*

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens \$1.50; 6, \$8.00; 12, \$15.00. Select untested \$2.00; 6, \$10.00; 12, \$19.00. Safe arrival and satisfaction guaranteed.

Circular free.

I am now filling orders by return mail.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky

I. F. MILLER'S STRAIN ITALIAN QUEEN BEES.

Northern bred for business; from my best SUPERIOR BREEDER (11 frames brood on April 7), gentle, roll honey in, hardy, winter well, not inclined to swarm, three-banded, 27 years' breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada. Untested, \$1.50; 6, \$8.00; 12, \$14.00. Select, \$1.75; 6, \$9.00; 12, \$17.00.

I. F. MILLER
Brookville, R. D. No. 2, Pa.

Good Queens

3-Banded or Golden

**Northern Queens
for Northern
Beekeepers**

THEY WILL PLEASE YOU.

Prompt shipment of queens reared in strong colonies and mated in strong nuclei.

Untested: 1, \$1.25; 6, \$7.00; 12, \$13.00;
100, \$100.00.

Safe arrival and satisfaction.

ROSS B. SCOTT

LAGRANGE

INDIANA



Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax.

THE A. I. ROOT COMPANY

873 Massachusetts Avenue, Indianapolis, Ind.

**BANKING
BY MAIL
AT 4%**

We have many out of town depositors. They send their deposits by mail. You can also carry an account with this institution. Savings draw 4% interest.

THE SAVINGS DEPOSIT BANK CO.
A.T. SPITZER, Pres.
E.R. ROOT, Vice Pres. E.B. SPITZER, Cash.
MEDINA, OHIO

QUEENS**FULL COLONIES
AND NUCLEI****QUEENS**

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had," "The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested	\$1.35 each; 25 or more, \$1.00 each	1 lb. of bees.	\$2.25 each; 25 or more, \$2.13 each
Select Unt. . .	1.50 each; 25 or more, 1.25 each	2 lbs. of bees	3.75 each; 25 or more, 3.56 each
Tested	2.25 each; 25 or more, 1.75 each	3 lbs. of bees	5.25 each; 25 or more, 4.98 each
Select Tested..	2.75 each; 25 or more, 2.00 each	Add price of queen wanted when ordering bees.	

Safe arrival guaranteed within six days of here.

NUECES COUNTY APIARIES**E. B. AULT, Prop.****CALLEN, TEXAS****PRICES REDUCED**

Discounts from our 1921 Red Catalog of "Falcon" Beekeepers' Supplies.

All prices given on:

Pages 1, 2, 3, 4, 5, 6, 7, 8	30% discount
Page 9	35% discount
Page 10	Less 12c per pound
Page 11	30% discount
Pages 12, 13, 14, 15, 16, 17, 18, 19, 20, 21	10% discount
Page 22	35% discount
Pages 23, 24, 25	10% discount

Distributor for the Central West

RODMAN SALES CO., GATEWAY STA., BOX 18, KANSAS CITY, MO.

W. T. Falconer Mfg. Co.

FALCONER, NEW YORK, U. S. A.

"Where the good beehives come from."

SECTIONS! SECTIONS!! SECTIONS!!!

While our present stock lasts we give the opportunity to buy No. 2 sections at a big reduction. We offer as follows:

No. 2— $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{7}{8}$	2-beeway Sections, per thousand..	\$8.00
No. 2— $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$	Plain Sections, per thousand	7.00
No. 2— $4 \times 5 \times 1\frac{3}{8}$	Plain Sections, per thousand	7.00

We are pleased to announce a big reduction in Bee Supplies. Send us a list of the goods you wish to purchase and we will quote you our new reduced prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

Quality Bee Supplies From a Reliable House

Without fear or favor I place my **BEE SUPPLIES** and **SERVICE** before you.

It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using **MONDENG'S** goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs. Send for my latest price-list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4x5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &

159 Cedar Lake Road.

MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist

AUGUSTA, KANSAS.

Established 1899.



Completely Destroys the Weed Growth

More than that, the **BARKER** breaks the hardest crust into a level, porous, moisture-retaining mulch—all in the same operation.

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 garden tools in 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send **TODAY** for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23.

David City, Neb.

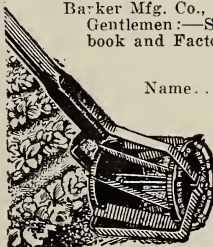
Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name.....

Town.....

State.....

R. F. D. or Box.....



THAGARD'S ITALIAN QUEENS

BRED FOR QUALITY

My three-banded queens are bred from imported stock; they are hardy, prolific, disease-resisting and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queens you may obtain anywhere, and **note the results.** I do not breed for quantity, but breed for quality. My queens have proven this to thousands of beekeepers that have tried them. Book your order now for July to October delivery.

July 1 to Oct. 1:	1	6	12
Untested	\$1.25	\$6.50	\$11.50
Selected Untested.	1.50	8.00	15.00
Tested	2.00	10.00	20.00
Select Tested	3.00	16.50	30.00

Safe arrival, pure mating, and perfect satisfaction guaranteed. Circular free.

V. R. THAGARD
GREENVILLE, ALABAMA

High Quality Queens at Reduced Prices

Three-banded Italians, reared from best hustlers, non-swarmling, gentle, and prolific. Satisfaction guaranteed. Health certificate with each shipment.

Untested	1 to 10, \$1.00 each; over 10, \$0.90 each
Select Untested	1 to 10, 1.25 each; over 10, 1.15 each
Tested	1.75 each

FRANK BORNHOFFER, R. R. 17, MT. WASHINGTON, OHIO



NORMAN BROS.' QUEENS



Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS. pure three-banded Italians and see for yourself. We are not going to say that we have the best in U. S. A., but we do say we have as good as can be bought for the money. Our bees are hardy, gentle, prolific, disease-resisting, and honey-gatherers. Orders filled promptly by return mail or your money refunded. We guarantee pure mating, freedom from all diseases, and safe arrival in U. S. A. and Canada. Remember that you take no risk when you deal with us. Isn't that enough said?

PRICES AUGUST AND SEPTEMBER:

	1	6	12	100
Untested Queen	\$.90	\$5.00	\$9.00	\$72.00
Select Untested	1.15	6.00	11.00	85.00
Tested Queens	2.00 each			
Select Tested	3.00 each			

NORMAN BROTHERS' APIARIES - NAFTEL, ALABAMA

**3-BANDED
QUEENS**

QUEENS OF UNSURPASSED QUALITY

**GOLDEN
QUEENS**

Our queens are reared from selected stock taken from the best strains of Italians known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey gatherers but also very resistant to disease, especially European foul brood. Every queen sent out by us we guarantee to give fullest satisfaction.

Price List of Our Queens:

Untested	\$1.25 each; 6 to 25, \$1.10 each; 25 and up, \$1.00 each
Select Untested ...	1.50 each; 6 to 25, 1.40 each; 25 and up, 1.25 each
Tested	2.25 each; 6 to 25, 2.10 each; 25 and up, 2.00 each
Select Tested	2.75 each; 6 to 25, 2.50 each; 25 and up, 2.25 each

Wings clipped free of charge. Safe arrival we guarantee. We have no disease in our apiaries.

OHIO VALLEY BEE CO., BOX 307, CATLETTSBURG, KY.

ROOT QUALITY

CANS

Screw Top—5-gallon, 1-gallon, $\frac{1}{2}$ -gallon, $\frac{1}{4}$ -gallon.

Friction Top— $2\frac{1}{2}$ -pound, 5-pound.

PAILS

Friction Top — 10-pound.

CARTONS

(For Comb Honey)

Folding printed for

$4\frac{1}{4} \times 4\frac{1}{4} \times 17\frac{3}{8}$ Sections.

$4\frac{1}{4} \times 4\frac{1}{4} \times 11\frac{1}{2}$ Sections.

4 x 5 x $13\frac{3}{8}$ Sections.

Plain Cartons. Cartons with your address.

SHIPPING CASES

for

$4\frac{1}{4} \times 4\frac{1}{4} \times 17\frac{3}{8}$ Sections.

$4\frac{1}{4} \times 4\frac{1}{4} \times 11\frac{1}{2}$ Sections.

4 x 5 x $13\frac{3}{8}$ Sections.

$4\frac{1}{4} \times 4\frac{3}{4} \times 13\frac{3}{8}$ Sections.

$3\frac{5}{8} \times 5 \times 11\frac{1}{2}$ Sections.

GLASS

Jars—16-oz. Round, lacquered screw cap. 2 doz. in partitioned plain case.

Tumblers — $6\frac{1}{2}$ -oz. Slip cap with waxed liner. 4 doz. in partitioned plain case. 40 doz. in a barrel.

PRICES ARE RIGHT

But due to changing market conditions we suggest that you write for price quotations. Price inquiries on quantity lots may be wired at our expense.

THE A. I. ROOT COMPANY

MEDINA, OHIO, U. S. A.

There is a Root dealer near you.

3-BANDED Highest Quality of Italian Queens GOLDEN

Twenty-five years of Select Breeding from the Best

After 25 years of select breeding, not all of the time in a commercial way, but as large honey producers, therefore rearing a great number of queens for our own use, we have strains of pure Italian bees which we believe are unexcelled for honey production, disease-resisting qualities, beauty, and gentleness. Owning about 1,500 colonies of bees which we run for honey, gives us ample opportunity to test them out in every way. As our apiary interests extend as far north as northern Ontario, we test them not only for honey production but also from a climatic standpoint. We find that our bees stand the long winters there with very satisfactory results. They are very hardy and long-lived. *Listen what others say about them:*

"M. C. Berry & Co., Hayneville, Ala.: The queens I got from you have all the others skinned! They are very gentle, best of workers, and stand the long winters here finely. Other queens coming from a shorter distance do not hold a candle to them."—Gilbert Plains, Man., Canada. (Name on request.)

"M. C. Berry & Co.: I wish to inform you that one of your queens made the most honey of any in the yard. It made 250 pounds honey against an average of 103 pounds for the yard. All of your queens made good. I never have had a queen from you that did not return a big per cent on the investment."—Marion, Ind. (Name on request.)

"M. C. Berry & Co.: One of your queens built up from a nucleus and made 360 pounds of surplus honey. Enclosed find \$75.00 for 50 queens. I want these for requeening European foul brood colonies as I find your stock resistant."—Troy, Pa. (Name on request.)

PRICE LIST OF OUR QUEENS.

Untested	\$1.10 ea.;	6 to 50, \$1.00 ea.;	50 to 100 and up, \$0.90 ea.
Select Untested	1.25 ea.;	6 to 50, 1.10 ea.;	50 to 100 and up, 1.00 ea.
Tested	2.25 ea.;	6 to 50, 2.10 ea.;	50 to 100 and up, 2.00 ea.
Select Tested	2.50 ea.;	6 to 50, 2.35 ea.;	50 to 100 and up, 2.25 ea.
Breeders	\$25.00 to \$35.00 each.		

Queens' wings clipped free of charge. Safe arrival and satisfaction guaranteed.

M. C. BERRY & CO., HAYNEVILLE, ALABAMA, U. S. A.

Make Your Bees Pay!

If you want bigger honey profits, **get the best queens you can buy.** This is the secret of successful bee-raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen-breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you, that I will gladly replace unsatisfactory queens delivered in U. S. or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

Prices August 1st to Nov. 1st.

	1	6	12
Untested	\$1.00		\$10.00
Selected Untested	1.25		12.00
Tested	2.50	\$13.00	24.00
Selected Tested.	3.00	16.50	30.00

Bees in two-pound packages: 1 package, \$6.00; 25 or over, \$5.80; 50 or over, \$5.40; 100 or over, \$5.00, without queens.

Place your order now. Prices low, quality considered. Write for circular and discount on large orders.

N. Forehand
Ramer, Alabama

Breeder of 3-banded Italian
Queens Exclusively.



SOUTHERN HEADQUARTERS RELIABLE THREE-BANDED ITALIAN QUEENS

BY RETURN MAIL

For many years queens from our stock have been used and recommended by a number of the largest producers of honey in the U. S. and Canada. We cannot afford to disappoint them, and we will not disappoint you.

Having several hundred colonies in outyards to select the very best breeding stock from, and large well-equipped queen-rearing yards, we offer you something good.

We pay special attention to honey-gathering qualities, but do not forget gentleness, beauty, etc. The Back-lot Buzzers like them just the same as the larger producers.

PRICES NOW—Untested: 1, \$1.00; 6, \$5.50, 12, \$10.50;
25, \$20.00; 50, \$38.00. Tested: 1, \$1.75; 6, \$10.00

Prompt service, safe arrival,
and satisfaction, we guarantee.

W. D. ACHORD, FITZPATRICK, ALABAMA



Leininger's Strain of Italian Queens

Have been carefully selected and bred for the past 38 years. Our queens are reared from selected stock taken from the best strains of Italian bees known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey-gatherers but also very resistant to brood diseases.

We will have 400 select tested queens that we will sell as long as they will last at the following special prices:

PRICE LIST OF QUEENS.

Untested, \$1.50 each; 6 to 25, \$1.40 ea.

Sel. Tested, \$3 each; 6 to 25, \$2.75 ea.

Breeding queens, \$10.00 each.

Every queen we send out we will guarantee to give fullest satisfaction.

FRED LEININGER & SON
DELPHOS, OHIO.

REQUEEN YOUR COLONIES

No time is better than right now to prepare for perfect wintering by requeening your colonies.

Use surplus brood for increase and give each colony of increase so made one of our young untested Italian queens.

One for.....\$ 1.25

Twelve for..... 14.00

One hundred for.. 98.75

Write or wire for our proposition by which we furnish honey containers free and sell your crop for cash at a small charge for our selling service that sells, and "Fosters your business."

THE FOSTER HONEY &
MERC. CO.
BOULDER, COLO.

PAILS---CANS---CASES

At greatly reduced prices. We are confident we can save western beekeepers on their requirements for all types of honey containers. Get our figures before buying.

AND---- at last, an inexpensive, but attractive advertising leaflet, bearing your apiary name, for distribution among your customers. Here is an effective means of building up a high-class retail trade. Let us send you sample, and quote.

The A. I. Root Co. of Iowa
Council Bluffs, Iowa

Queens that look like this. Bred for quality rather than quantity.



Guaranteed to give satisfaction. Prompt service, quality and mating guaranteed.

SOUTHLAND QUEENS

Three-Banded Leather-Colored Italians—Bred from Selected Root Home-Bred Breeders
—Backed by Over Fifty Years in Breeding the Best Queens.

Untested\$0.75 each
Selected Untested 1.00 each

Tested\$2.00
Breeders.....\$5.00 to \$15.00

POUND PACKAGES

Shipped on comb of fdn.

One-pound bees, no queen...\$2.00
Two-pound bees, no queen.. 3.75
Three-pound bees, no queen. 5.25

NUCLEI

One-frame, no queen.....\$2.00
Two-frame, no queen..... 3.75
Three-frame, no queen 5.25

Distributors for Root Quality Bee Supplies. We are the beekeepers' bargain house. It will pay you to get our prices. Catalog on request. Shipments direct from factory at our prices.

THE SOUTHLAND APIARIES, HATTIESBURG, MISS.

PRINTED STATIONERY

THE ROOT QUALITY KIND



VERY BEEKEEPER, EVERY FARMER—in fact, every business man—will improve his business standing with his friends and customers by using printed stationery. A nicely printed letterhead enclosed in a neatly printed envelope carries dignity with your message to your correspondent. We print just that kind of stationery. We please others, and we surely can please you. Send for sample book and prices.



ATTRACTIVE HONEY LABELS

WILL HELP SELL YOUR HONEY



WHEN YOU BUY PACKAGE GOODS, one of the first things to attract your eye is the label, isn't it? So it is with the other fellow. That is the big reason why your honey package should bear an attractive label. We print that kind, and at reasonable prices.

Send for a catalog showing exact reproduction of many styles of labels and the prices.

THE A. I. ROOT CO., WEST SIDE STA., MEDINA, OHIO

Honey is coming
in pretty fast now.
You are in need
of pails, cans,
shipping cases,
and cartons.

This is honey
weather all right.
Don't get left.
Send in your
order at
once.

Fine Season, Isn't It, Mr. Beekeeper?

What can we do for you?

We can give you

Service

Quality

Promptness

Low Prices

Have you our new discount sheet?
New York State Beekeepers, write us
for same.

F. A. SALISBURY

1631 W. Genesee Street
SYRACUSE, N. Y.

Mail,
Express,
or Freight
shipments.
Write us
today.

Get our
quotations;
then send
in your
order.

The Question—

Shall I Requeen Now?

The Answer—

Authorities Urge Requeening During Late July and August--Because

—The fall queen is cheaper. Unlike an old queen, a new queen in the fall will lay well regardless of the fall honey flow. At least two full cycles of brood should be laid by the new queen, insuring a strong colony for wintering.

—Requeening means a break in egg-laying of nearly one week, with the consequent loss of brood and bees. With spring requeening this loss of bees is a real loss in honey later.

—Fall requeening brings this loss at a time when the least damage is done. Requeen now. Do not wait till spring.

—Root Queens are hardy, disease-resisting, gentle, and prolific.

QUEENS

Untested queens	July-Oct.
Select Untested	\$1.20
Tested	1.50
Select Tested	3.00
	3.50

NUCLEI

(By Express)

NUCLEI—Our one, two, or three frame nuclei go out on full worker combs in wired frames, well supplied with bees and the proper amount of brood.

	Weight.	July-Oct.
1-frame Nucleus, no queen.....	4- 7 lbs.	\$2.10
2-frame Nucleus, no queen.....	9-12 lbs.	3.30
3-frame Nucleus, no queen.....	12-16 lbs.	4.50
5-frame Nucleus, no queen.....	22-27 lbs.	6.30

If queen is wanted, make a selection and add her price to the above.

BEEES BY THE POUND

(By Express)

	Weight	July-Sept.
1-lb. pkg. of bees, no combs.....	3 lbs.	\$2.10
2-lb. pkg. of bees, no combs.....	5 lbs.	3.30
3-lb. pkg. of bees, no combs.....	7 lbs.	4.50

If queen is wanted, make a selection and add her price to the above.



THE A. I. ROOT COMPANY
MEDINA, OHIO, U. S. A.

**A Superior
Quality at
Less Cost**

SUPPLIES

**A Superior
Quality at
Less Cost**

All of the supply manufacturers have at last reduced their prices; but, as a beekeeper pointed out to us last month, the reduction in prices made is not nearly as great as the reduction in prices of Honey.

This is perfectly true.

Our sympathy in the campaign for low-supply prices has been entirely with the beekeeper, and a comparison of the prices as listed below will show that we can save the beekeeper money on supplies.

These supplies are made by the Diamond Match Co., and are of a superior quality.

Hives, Supers, etc., listed below are in the flat, and are complete with Hoffman frames, nails, metal rabbets, and all inside fixtures.

One-story Dovetailed Hive

Five 8-frame\$13.50
Five 10-frame 14.30

Full-depth Supers

Five 8-frame\$6.70
Five 10-frame 7.60

Shallow Extracting Supers

Five 8-frame\$5.00
Five 10-frame 5.50

No. 1 Style Comb Honey Supers

Five 8-frame\$4.80
Five 10-frame 5.25

Standard Hoffman Frames

100\$7.20
500 33.00

Our Incomparable Quality Foundation

Medium Brood

5 lbs. .74c per lb.
25 lbs. .73c per lb.
50 lbs. .72c per lb.

Thin Super

5 lbs. .80c per lb.
25 lbs. .79c per lb.
50 lbs. .78c per lb.

Light Brood

5-lb. lots 76c per lb.
25-lb. lots 75c per lb.
50-lb. lots 74c per lb.

Aluminum Honeycombs as now made by Duffy-Diehl Co. are met with success. We carry these in stock to supply Eastern Beekeepers.

Hoffman & Hauck, Inc.

Woodhaven, New York

Experience

is a great teacher.

Do you profit by the experience of others?

During our twenty-nine years of successful commercial queen-rearing we have helped many of America's best beekeepers find the road to success. Another improvement on your present successful plans may have a vital and valuable influence on the future course of your business, as it did on W. G. Warnock's, Proprietor of the Oakwood Poultry and Fruit farm at Geneseo, Illinois. In his last order he said:

"The package and queens I got from you last season did finely. I divided and built up three good colonies. The queens were very prolific. In four weeks after receiving this package, they had eight frames of brood and honey. I handle them without either smoke, veil or gloves."

PRICES.

	1	6	12	100
Untested	\$1.25	\$ 6.50	\$11.50	\$0.90
Select Untested	1.50	7.50	13.50	1.00
Tested	2.00	10.00	18.50	
Select Tested..	2.75	15.00	27.00	

We guarantee pure mating and satisfaction the world over. Safe arrival in the U. S. and Canada.

W. J. Forehand & Sons
Fort Deposit, Ala.

QUEENS

Reared this season to July First, all sold and could have sold more. Why? Because the thousands we have sold must have given satisfaction.

Untested, 1 to 12 - \$1.00 each
Untested, 12 or more - .75 each
Tested, 1 to 12 - - 2.00 each
Tested, 12 or more - 1.50 each
Breeders - 5.00 to 25.00 each

Safe arrival and satisfaction guaranteed. Return dead and un-satisfactory queens.



THE STOVER APIARIES
MAYHEW, MISS.

HUBAM

The Great Honey Bearing Clover



PRACTICAL experience with Hubam, the annual white sweet clover discovered by Prof. Hughes, is proving that it surpasses expectations in the richness of its honey-bearing content. It blooms in three to four months and continues blooming for a longer period than other honey-bearing plants.

These advantages promise to make Hubam an influence of the first importance in the business of beekeeping. It will establish a new low standard of costs and enlarged production. The use of Hubam is rapidly becoming a necessity for the successful beekeeper.

Quick growth and an unusual wealth of honey-making blooms are combined with a legume action that returns large quantities of valuable plant food to the soil.

We are large-scale growers of Hubam seed with acreages in Texas, Ohio, and North Dakota. To prevent accidental mixing of seeds we grow only Hubam clover and guarantee the purity of the seed.

Some seed of the 1921 crop is now available.

THE DE GRAFF FOOD COMPANY

Seed Department, 303
DE GRAFF, OHIO

REQUEEN

AUGUST is the month to requeen and prepare for winter as well as next year's honey crop. Desiring to secure our stock, many purchase a number of our guaranteed queens in August or September and from them select their breeder for the following season. As the prices of nearly all commodities are being reduced, we are accordingly reducing the price of our queens, this reduction to take place August first. We have sold breeding queens to many large honey producers and queen-breeders thruout the United States, Canada, and other parts of the world, and all are much pleased with our stock. A notable example of these is J. E. Wing of California, one of the largest queen-breeders and shippers of pound packages in the world. He has purchased breeders from many sources in the past and writes: "This season the Jay Smith strain has been secured, and these are equal, if not superior, to anything I ever had."

Hundreds who have purchased our guaranteed queens in the past, speak in highest terms of our stock. In the main, the reasons they give for preferring our stock are because they are gentle, they are of uniform yellow color showing good breeding, because they are excellent for eradicating European foul brood, and for the fact that the queens are large, indicating a capacity for heavy egg-production, which means strong colo-



nies that get the big crops of honey.

Remember, I guarantee pure mating, safe arrival, and general satisfaction. I send out but one grade of queens, and that the very best I am capable of producing. If any queen should prove other than a first-class queen, I shall consider it a favor if the purchaser report the matter to me that I may have the opportunity to replace her. A card will bring our catalog.

Price list after August first: 1 to 4 inclusive, \$2.00 each; 5 to 9 inclusive, \$1.95 each; 10 or more, \$1.90 each. Our very best breeders, \$12.00 each.

JAY SMITH

ROUTE THREE, VINCENNES, INDIANA